

SUPPLEMENT.

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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Original Correspondence.

THE NORTH OF ENGLAND IRON TRADE—No. II. THE CLEVELAND IRONSTONE.

Proceeding to speak of the development of the Cleveland ironstone by individual firms it may be appropriate to make a few remarks as to the *modus operandi* of its extraction and use. The hematite ore of the Western Counties, the ironstone of the Cleveland district, is found in regular horizontal beds, and is, therefore, with comparatively small risk, and in large quantities, worked by the open-pit method, the depth of the mines varies very considerably, but there is probably no shaft in Cleveland deeper than 100 ft. The majority of the ironstone mines are worked by a drift from the face of the hills or cliffs, in which Cleveland is situated. The present cost of working is about 1s. 4d., and the payment varies from 4d. to 9d. per ton. The ironstone is used in the furnaces in the Middlesborough district at 5s. to 6s. 6d. per ton. These figures are, of course, like the current cost of every other mineral, subject to fluctuations. Miners are now getting 7s. 6d. per day, formerly they did not average more than 5s. Only three years back the cost of raising the stone was 10s. per ton, and it was delivered to the consumer at 15s. The usual output is 5 to 6 tons per acre of eight hours. There are in the majority of mines the first shift commencing at 6 o'clock in the morning, the second at 2 o'clock in the afternoon; the third beginning at 6 o'clock in the evening, and terminating at 2 o'clock in the morning.

Throughout the greatest part of Cleveland there is a portion of ironstone, at the top, about 3 ft. thick, and separated by a thin layer of sand from a mere point of separation to a thickness of 10 inches from the remainder of the bed. The 3-ft. seam is the workings to form the roof of the mine. The remainder of the seam varies from 8 to 10 ft. in height, and occasionally reaches 15 ft. or even more. In extracting the stone head ways are driven at wide and 90 feet apart, from which at intervals 30-feet are excavated, 15 feet wide. By this system pillars are left by 30 ft. wide. When the limits of the royalty are reached, the ironstone is removed, with a loss of something like 10 per cent. contents, so that in a good working, free from faults, the whole ironstone, within perhaps 7½ per cent., can be taken away. reference to the probable extent and duration of the Cleveland ironstone different opinions almost necessarily prevail. Mr. G. A. well-known authority, estimated that the area over which the ironstone was likely to be found would not be short of 420 miles, at the yield would average 20,000 tons per acre. Hence it is that 5,000,000,000 tons are contained in the main Cleveland ironstone. Curiously enough, it has also been calculated that there are 10,000,000,000 tons of coal left for use; so there is just about fuel enough in the one district, reserving it for that purpose, to smelt the ironstone contained in the main of the other. In a paper read in the session 1869-70 before the Cleveland Institution of Engineers, Mr. William Cockburn, of the Upleatham and Skinningrove Mines, calculated that the stone would be found in sufficient quantities for 73 years, at 75,000 tons per week as the average consumption. On the other hand, Mr. John Jones, F.G.S., secretary to the North of England Iron Trade, stated last year before the Select Committee of the House of Commons appointed to deal with the Cleveland Extension Bill that the supply of ironstone in Cleveland would last 73 years, even at an increasing ratio of consumption. In forming an opinion on the matter there are several contingencies that have to be considered. Unless the ironstone yields 22 to 25 per cent. metallic iron it can only be worked at a loss; or, in other words, it requires that percentage to pay for wages and materials, and taking depreciation into account at all. But after the first year has been exhausted there is a redundancy of second-class ironstone, that is not now thought worth the trouble and cost of working. It only requires an adjustment of the prices of pig and iron, corresponding to the extra expense of working, to allow of the inferior stone being developed, and then it is likely that the Cleveland hills may yield an adequate supply for 100 years or more. At the present time there are about 1,000 tons of ironstone under lease and unworked, which, according to Mr. Jones, would give a yield of 7,740,000 tons per acre equal to 37 years consumption. But we are yet a long way from this rate of exhaustion. The total quantity of pig-iron in the Cleveland district in 1871 was 1,884,000 tons, which represents a yield of 5,652,000 tons of ironstone. Last year the output of pig was close on 2,000,000 tons, and the consumption would be little, if any, short of 6,000,000 tons. About 20 new furnaces are now in course of erection, and others are being completed. Each of these new furnaces will consume 1400 to 1600 tons of ironstone weekly, so that when they are all in blast the output is likely to be very materially increased. It is only the gradual increase of the ratio of consumption for years to come that is likely to be a serious contingency. Arrangements are now being made in different parts of the district to undertake the additional requirements of the trade, and the case in the north part of the Cleveland district, where the ironstone is being worked on a large scale have lately been going on, and at the same time it is intended to take such steps as will materially augment the output. There is a growing disposition among owners of ironstone to secure mines of their own, this course being rendered necessary by the irregularity of the supplies they receive from the principal mineral workings, both new and old, we have occasion to speak more particularly when treating of the ironstone carried on by the various firms in the Cleveland district. It was necessary to an intelligent comprehension of the nature and extent of the trade carried on in Cleveland that this introduction should be written. It should be added that the above figures do not represent the total quantity of ironstone consumed in the Cleveland district, for a considerable quantity of hematite is nearly every firm; and, indeed, the Messrs. Bolckow and

Vaughan have steamers regularly plying between their hematite mines in Spain and Middlesborough.

It is estimated that the furnaces of Cleveland consume upwards of 5,000,000 tons of fuel, most of which is taken from the South Durham district. Before being used in the furnaces the coal is made into coke, either at the pit's mouth or at coke ovens, erected elsewhere for that purpose. The following analysis of the best Durham coke, per Mr. Crossley, F.C.S., may be interesting:—

	Per cent.
Ash.....	4.10
Sulphur.....	0.58
Volatiles matter.....	0.31
Moisture.....	0.40
Fixed Carbon.....	94.61—100.00

Of limestone, which is obtained chiefly from Weardale and its neighbourhood, upwards of 1,500,000 tons are annually consumed in Cleveland. On the same authority, we give the following analysis of the Weardale limestone:—

	Per cent.
Carbonate of lime.....	95.59
Carbonate of magnesia.....	2.46
Alumina.....	0.38
Protoxide of iron.....	0.29
Siliceous matter.....	1.33
Mixture.....	0.10—100.44

More lately a large quantity of Forcett limestone, which is nearer hand, has been used in the Middlesborough furnaces, and considerable supplies are also obtained from Raisley Hill. The Forcett stone gives the following analysis:—

	Per cent.
Silica.....	1.91
Alumina.....	0.36
Oxide of iron.....	0.41
Carbonate of magnesia.....	3.10
Carbonate of lime.....	93.43—99.71

Altogether, upwards of 12,000,000 tons of raw material, including coal, limestone, and iron ore, are required to produce the annual yield of the Cleveland furnaces.

COAL MINES REGULATION ACT, 1872.

SIR,—In the *Mining Journal* of Jan. 11, page 3, there was attributed to me certain comments on the *status quo* under the Act which were none of mine, though following so closely on what I did say at the meeting of the South Midland Institute of Mining Engineers as to be readily supposed to be mine. I am there represented as enquiring who, during the time that no certificates of service have issued, would be held responsible in the event of any explosion or other accident the result of mismanagement? I certainly should not have put such a question except as "returning answer to itself," because it is quite clear that under the Act the "owner" is liable for whatever occurs, unless he can show that it did not occur from disregard of any obligation created by the Act; or, if it did arise from any such disregard, then that he had taken all reasonable means to prevent its occurrence. He could not, of course, be liable for non-appointment of a registered certificated manager when none existed, but he might be held liable for non-appointment of a "probationary" manager if he could with reasonable diligence have got one. This was what induced me (when I found that my book on the Act could not be issued by Jan. 1) to send to collieries generally a form for appointing a probationary manager, with footnotes on its use and purpose, as printed in the *Journal* of Jan. 4.

But in your said issue of the 11th inst. appears also a letter from a "Middleman," which shows that there is a false conception of the protection which attaches to an "owner" under the Act, as he takes it for granted that, because there is not for the mine a registered certificate holder, therefore the owner has no alternative but either —1, for the works to stand; or 2, carry on contrary to law. I have already shown that this is not so.

In regard to what he says about middlemen, however, there is some force, but why should he assume that all the managers are to be men of college attainments—very few, indeed, should we get in this district if they were; or why should he assume that the examination is to be of such character as only to admit such men? Surely the Inspectors have not so taken leave of their common sense as to impose a mere theoretical test, when so many of them have, in their reports, dwelt on the necessity for practical knowledge, and when the Act itself expresses the same views. But if they should thus err, does he forget that the board is to be composed of four different elements—1, three "owners"; 2, three persons being either mining engineers, agents, managers, or coal-viewers; 3, three persons not being either owners, agents, or managers (which three persons, by the Home Office instructions to the Inspectors, may be over-men, under-lookers, firemen, deputies, or working miners); and 4, the district Inspector. If a board thus constituted appoint as examiner a man who will give theory undue prominence over practice, their choice will be singularly unfortunate. If owners have a prejudice, as between a "college" man and a practical man, I doubt if it be in favour of the former; and then as regards mine engineers (even if you credit them with mere human infirmity, unchastened by a sense of public duty, when discharging a public function), if there is *esprit-de-corps* there is also jealousy. I incline to think, so far as my limited knowledge of the subject enables me to judge, that the hard-and-fast line which has been observed in regard to middlemen and deputy-managers has gone rather too far in the direction of excluding them from "certificates of service;" but I think that wherever the special rules of a district have constituted any man a "manager," that he must be considered as having "acted in the capacity of a manager" within sec. 31 of the Act, and should make a proper representation of the fact to the Home Office. Recollect that the Home Office cannot be omniscient; and in many cases may refuse certificates simply because the facts as to past service have not been placed before the authorities with sufficient precision. Recollect, also, that the certificate of service is not for present occupation, and that if a man has acted for as much as 12 months during the five years before the Act passed "in the capacity of manager," then he becomes entitled to the certificate without any reference to his actual present status or occupation. So far is this the case, I think that if his past service thus entitles him he will not be dissatisfied, even if (now) he be a contractor for getting the minerals in the mine, or in the employ of such a contractor. I say he is entitled to the certificate to look at, to keep by him, and to use, whenever and so long as he is not a contractor, nor in his employ. Perhaps you will allow me here to say to many impatient ex-

pectants of the second edition of my book, that it is in order to give the fullest practical comment for purposes of utility on such subjects as the above that I continue, even during its passage through the press, to revise and amplify its language in the notes, and it often occurs in reading through a proof in print that a new idea, or form of expression, or relation of matters occur which seem to claim admission. The public may be sure that self-interest would induce me to push it through the press ready for sale, and the rather, as the announced price is a "fixed" quantity, and all these additions largely augment the cost (to me) of the publication. There is, however, a sense of self-respect and pride of authorship (call it if you like enthusiasm) which determines me to labour at making this edition as little imperfect as my limited time permits, but I earnestly hope and believe that next week may see its actual issue; and, further, that nothing I have here written may raise expectation unduly as to its merits.

The same remarks apply to my book on the Metalliferous Act, which will see the light at about the same time, as I hope and believe. The delay has partly, however, arisen from the difficulty experienced by provincial printers in procuring a sufficient number of competent hands.—*Bilston, Jan. 29.* JOHN WILLIAM HALL.

P.S.—My remarks as to the books apply also to the publication of Forms for use, but all, except those to be bound, are now ready.

THE CUMBERLAND COAL FIELD.

SIR,—I have read, as copied into a Carlisle paper, with much interest, the article which appeared in the *Mining Journal* of Jan. 11 upon the above subject. The writer, however, is probably not a native of these parts, else I think he might have learned something of the localities near to Carlisle where attempts have been made to find coal. From the strata found in digging deep wells in Carlisle, it was long supposed that coal existed underneath the city and neighbourhood, one of the attempts made to find the correctness or otherwise of the surmise was on the side of a hill, to this day called Coalfell Hill, about 1½ mile from Carlisle. Another bore-hole is now to be seen in the bed of the river Eden, in the summer season, when the water is low. The place, which is about 2 miles from Carlisle, and is situated to the north of the before-mentioned trial place, is called "Spa Well," the water issuing from the bore hole having a slightly sulphurous taste and odour. The following extracts from the *Carlisle Journal* of Sept. 28, 1807, may be of interest. "Mr. D. Pattinson, after considerable time spent in boring at Knockward (near Coalfell Hill), has found a seam of coal 4½ ft. thick;" and the same paper, of July 16, 1808, says, "Mr. Pattinson still perseveres in his attempts to find coal."—*Carlisle, Jan. 28.* D. H.

THE NEW POWDER—PUDROLYTHIE.

SIR,—I have read with considerable interest the several reports which have appeared from time to time in the *Journal* respecting the new patent powder called Pudrolythe. From the satisfactory nature of the experiments I should judge it to be a valuable invention, and when the freedom from danger in its manufacture and use is taken into account I think it would be universally adopted for blasting purposes. It is somewhat strange and unaccountable, however, that after it has been so rigidly tested and experimented upon, and the results of such tests and experiments have been so reassuring, that no attempt has been made to introduce it into the market. Perhaps some of your numerous correspondents are in the possession of information which will enlighten us as to the time when we may expect it to be ready for use; or, better still, the inventor, or his agent, might just drop a hint what hindrances are retarding its being made a marketable commodity. *Plymouth, Jan. 28.* THOS. WILLIAMS.

TIN DRESSING—THE RED RIVER.

SIR,—I should not have again troubled you on this subject had not a certain section of your correspondents thought proper to characterise scientific and practical men who suggested improvements in the present system of tin dressing as utterly incompetent. I would not be so much surprised if any gentleman who contributed sound and practical information had indulged in depreciating remarks, but when I perceive those meddling in the matter who have completely failed to contribute one iota of information, then I must say my astonishment is great, and I would advise such to show something practicable themselves before they sally forth in so high-handed a way to laud themselves above their fellow-men. I do not retract a word of what I have already written, and I have no hesitation in saying I would not allow a single pound of tinstuff worth retaining to escape from the mines. If any writer be so ignorant of the properties of oxide of tin as to state that it is carried away in solution from the mines, then I would suggest he had better not write on the subject at all. I am myself a Cornishman, and, therefore, unwilling to regard Englishmen as any other than the best miners in the world; but I cannot, as a friend of my countrymen, stand by and say "it is well, it is well," when I see that important improvements may be easily and cheaply effected.—*Glandore, County Cork, Jan. 28.* Y. T.

TREATING LEAD SLIMES.

SIR,—I was fairly astonished on reading Mr. Ennor's letter about the treatment of lead slimes at the Mendip Hills, for during all the ten years I had the management of the works I never heard his name mentioned, though I very often stayed there a week or two at a time. I was appointed just after the lawsuit, and went down with Mr. Barwell, the Chairman, with the understanding that if I saw there was a chance of working the deposits they would get a new lease. Well, I reported that there was no difficulty, and that it was only necessary that the deposits should be worked on a large scale, so that 20 tons of lead could be returned in the month. To do that it was necessary to make the works large enough to dress sufficient ore to yield that quantity. I said a reverberatory-furnace would be required and two blast-furnaces, and these were all finished within three months, and with 150 people always at work we could do the work easily.

We had no trouble whatever about the water. The fact is there was no person who knew how to dress slimes, or they need never have had any legal troubles. It only shows how many good things are lost through not knowing how to do work properly. The com-

J. WALKER.

I only carried out tin in No. 1 letter as far as the minute particles in the sea-beach. I next remark in No. 2 letter, dated Dec. 21, 1872, said about 60,000*l.* worth of tin was annually caught by the squatters from apparent report, if all the lords' dues are taken into account handed to me; in fact, squatters and others say it is far more, but my object is to keep these reports within bounds. Then it is asserted that the sea beach is worth *1*l.** per ton; this is what is seen here between the tides, only in minute particles and too small to be caught by squatters. Then, the next class is smaller still, and would be still visible were the sea to suddenly recede for a quarter of a mile. Then comes my grand point; these small particles and atoms are made by heavy stamp-heads on tin that is literally impounded until it is beat to slime, from what the mine owner catches to every

THE COMMONWEALTH OF MINING.

Now, one is tempted to ask, why should not the lords of the soil have a bonus upon the successful costeaning or surface works of work-

LEAD MINES OF GREAT BRITAIN

Let us trust, however, that experience will teach even the most cautious to be more cautious in the future, and to this end we express these remarks to you, Sir, by whom so much valuable practical advice in the selection of investments is constantly afforded in the best of all forms—the publication of the truth concerning the various mining properties generally. Those of your readers who are in the practice (as all investors should) of perusing the weekly *Mining Journal*, as published in the *Mining Journal*, will have observed the wonderful progress made by the Denbighshire Consolidated Mines, a report of the meeting of the shareholders of which we are glad to publish in this Number. These mines, under favourable conditions, and with the aid of the most modern and efficient mining works, or, rather, surface scrapplings, paid over £100,000 in the year 1832. They are situated in a district which gives every promise of which only requires the application of capital and practical knowledge to return vast mineral wealth. Those mines which have been worked in the locality have given, in the majority of cases, a return of 10 per cent. on the capital invested. The Mold Mine returned dividends in six years, viz. from 1829 to 1834—to the amount of 52,933*l.* and to what an extent will this profit have been increased now when railway facilities are afforded to the district? Again, the well-known mine of Maes-y-Si

not seen anything to equal the piles of ore which are being drawn up since the working of Alfred Consols. But few companies, perhaps, have been more persevering than this, and now they have their reward in a harvest of large, rich, and lasting returns of ores. The unwearied energy, indefatigable perseverance, and intense interest which has been manifested by Captain Stevens should not be lost sight of. There are but few agents that have had greater difficulties to cope with than he has, and hence great praise is due to him for his able conduct during the protracted period of evils which surrounded him.

This mine is as yet in its infancy. What they are now doing is nothing when compared with what will be done as soon as the deepest levels are communicated with the new engine-shaft; they are making rapid progress with the putting in of the new engine, which no doubt will be at work in about 4 or 5 weeks time. When the mine is thoroughly opened, judging from present prospects, I have no hesitation in saying that there is every probability of this mine turning out equal to the Great Wheal Alfred of old, and Alfred Consols of a more recent date.

I have not much doubt that the success which has attended this mine will induce speculators to try virgin ground in its vicinity, and of this there is a great deal on every side which may prove quite as productive. I believe that at no great distance the prosperity that once marked this neighbourhood will be again experienced. Capital, energy, care, and economy, are all that are necessary to bring it about. By your permission I will give you some other jottings for next week's Journal.

Synolds Dyllwen Copper Mine, near Carnarvon, Jan. 24.

J. W. ROBERTS.

THE AUSTRALIAN UNITED GOLD MINING COMPANY.

Sir,—The remarks in last week's Journal respecting the Australian United Gold Mining Company appear most just to me. Why do the directors withhold the important information, published in the *Melbourne Argus* of Dec. 6, that the yield of the Central Mine for the month of December was 200 lbs. of gold to the value of £1,000, showing an average of 20 ozs. of gold to a machine? If the directors know these things they should inform the shareholders; and, if they do not, it is their duty to know them.

W. B. (A Shareholder.)

WHEAL WHISPER TIN AND COPPER MINING COMPANY.

Sir,—Will you allow me space to call attention to the statement of accounts and balance-sheet of this company, just issued. I cannot understand why the mine set machinery should be put down at double the capital account. A merchant would hardly treat his stock in trade after this fashion. He is generally satisfied with putting it at prime cost, leaving the question of depreciation to subsequent realisation. An incidental addition to such a pleasant fact might be well enough in the directors' report, but it seems to me that the balance-sheet should be confined to a detailed synopsis of the books of account. The profit on the business seems hardly to be presented in an intelligible shape. As I interpret the accounts I make the proceeds of sales and stock on hand amount to the sum of £563. 3s. 5d.; expenses paid and liabilities outstanding to £245. 11s. 5d.; leaving a net profit of £318. 12s. If I have misinterpreted the statement I shall be delighted to have my figures corrected, provided they can only be made conclusively favourable to—

A SHAREHOLDER'S POCKET.

WEST CARADON MINING COMPANY.

Sir,—The recent discovery of copper ore in the 30 and 42 has caused these shares to look up a little. On reference to last week's *Mining Journal* I find that on Jan. 23 there was sold from this mine 108 tons of copper ore which realised on an average 3s. 19s. 10d. per ton. The average price of ore from the following mines was:—

	Per ton.		Per ton.
Devon Great Consols	£3 5 6	Wheal Friendship	£3 13 6½
Hingston Down	2 9 6½	Belford United	3 7 11½
West Maria, &c.	2 5 4	Gunnislake (Clitters)	3 5 10
West Caradon	14s. 4d. more per ton than Devon Consols;		
8s. 3½d. more than Hingston Down; 14s. 1½d. more than West Maria; 6s. 3½d. more than Wheal Friendship; 11s. 10½d. more than Belford United; and 14s. more than Gunnislake. By these few extracts it will be seen that the ore is of a good average quality.			

It is believed, my almost known, that when the new shaft on the course of the lode in Hallett's cross-course is down a reasonable depth that large bodies of mineral will be found (it is to be hoped in sufficient quantities to in some measure repay the adventures for their patience and outlay). The 30 is already in good ore ground at about 4 fms. from cross-course, the present yield being about 2 tons of ore per fathom, though the lode till recently yielded 3 tons per fathom; this falling off is regarded by the agents as only temporary. The shaft, I should have stated before, is but 5 fms. from surface, and even at that shallow depth the lode has a most promising appearance, but the water being quick, it was found advisable to defer sinking the shaft until the 30 had been driven far enough to unwear water.

Having noted a few words concerning the mine I will now refer to the large number of shares into which this adventure is divided. On looking at the Mining Share List I do not find one single English mine that is divided into many shares as West Caradon. It is a great pity that the shareholders permitted their shares to be tampered with in this way, and it is to be hoped that the directors will in their next annual report to the shareholders propose some scheme for reconstructing the company, whereby the large number of shares at present existing will be considerably reduced.

EDHO.

WHEAL MARY (ST. DENNIS).

Sir,—Having seen the reports regularly inserted in the *Mining Journal*, I thought I would pay the mine a visit, and on Tuesday last I called on Capt. Parkyn, the manager, and he very kindly showed me over the mine. I find they have a powerful steam-engine now in course of erection; 24 stamps are to be attached to the engine, and the dressing-floors are now being laid out. I then went to see the great north lode, which is open from the surface to a depth of about 5 fms.; here is about 16 ft. wide, and such rocks of tin as I never remember in all my experience seeing; in fact, the lode throughout is full of tin of the richest quality. Such a discovery of tin has not been made in this neighbourhood for many years, if ever there was before. The lode can be quarried out and sent to the stamps at a very small cost, while the lode is worth near 50s. per fathom. In addition to this valuable lode there are several others that are most valuable; one, called the Pleylo lode, is worth by an assay 1 cwt. of tin to the ton of lodestuff, and they have now about 1000 tons of lodestuff from this lode ready for the stamps. Upon the whole, it is the best discovery of tin, and presenting the best prospects, I ever had the pleasure to inspect. This mine cannot fail to pay large profits to the shareholders, in my opinion.

St. Austell, Jan. 30. GEORGE STEPHENS, Mine Agent.

FRONVELLAN MINE.

Sir,—In perusing the columns of last week's *Journal*, I was exceedingly glad to find that one of your correspondents had referred to the Fronvellan Mine, which has, indeed, created quite a *furor* in this district. There are some instances in which the reports of certain young mines are very exaggerated, but in this particular instance I have every reason to believe, from the stuff that I saw being brought out, that, if anything, the general productiveness of the lode is more than what it is actually reported. I feel convinced that when it has gone through the process of dressing it will prove my assertion, and that the Fronvellan will prove as its original name implies (Rhiwlynw) a mountain of lead; and it is no matter of wonder to me that being eagerly other sets being taken up in its vicinity having the same or parallel lodes traversing them. The district has, up to the recent discovery at Fronvellan, been quite unknown as regards its mineral wealth, but from the present aspect of the horizon the clouds are being speedily scattered, and capitalists are turning their attention to these mountains, which undoubtedly contain inexhaustible wealth, especially to the west of the Fronvellan Mine. In conclusion, I beg to congratulate the fortunate shareholders of the mine on the excellent prospect they have there.

A NEIGHBOURING MINE AGENT.

EAST LLANGYNOG MINE, AND ITS MANAGEMENT.

Sir,—I observe by last week's *Journal* that there is at last some prospect of this mine being productive in depth, which I hope will prove so. I can assure you the patience of many shareholders is high, and I am glad to hear that at the meeting in April last that piles of ore at surface and in levels, and lodes in wide, solid lead, were only waiting for machinery to dress, which it was stated then would be soon erected; and the meeting specially desired it to be accelerated, so that the monthly returns might be increased, as was stated they could be doubled or trebled, not the slightest verification of which, however, has yet been made. A monthly report occasionally appears in your columns with the same stereotyped statements nearly, but no realisation, and the price of shares are now about 11s., or one-third what they were then, and what many were induced to purchase at.

Many friends of mine who are not shareholders are very anxious to see a change in the office; and I respectfully call the Chairman's attention to the feeling prevalent a few months ago as to having some knowledge of what was being done at the mine, and whether the great hopes held out were real or not; but he said it could not then be done, a few pounds to enlighten us was considered serious. I think it is high time for my fellow-shareholders to wake out of their lethargy. We want a thoroughly practical manager on the spot for so large a property, devoting his whole time and energies to its proper development, and responsible to both the directors and shareholders. Be up and doing, as the meeting will be held next month, and an alteration is imperatively required. Anyone wishing to communicate with me may do so by writing to "Delta," Coloured Cloth Hall, Leeds.

DELTA.

SHARE-JOBBER—LONDON AND CORNWALL.

Sir,—I admire your impartiality, and the liberality with which you allow at all times your columns to be the medium of fair and rational criticism. My object is to endeavour to show you how my friend, Mr. Verdict Confident, was sold and done by a Mr. Grabbal Neverpart, of the West. It was in this way. On a visit to Redruth he formed the acquaintance of Mr. Grabbal Neverpart, and after his return to London a correspondence sprang up, in which the country gentleman was very attentive in keeping Mr. Verdict Confident well informed of what was going on in the mines he was interested in. So this interchange of civilities passed between them, when one morning amongst my friend's letters there was one from his Cornish acquaintance asking him to buy some shares in the S. B. Mine, on joint account. There was a splendid improvement in the 190 fm. level. He had just seen a miner with hatbox full of stones of ore, which he had turned over and spit upon, and knew they must come from a lode that was a "regular bonnie." "The specimens would do your eyes good to see them." His letter finished up by saying, "Now, do let me in and buy for the life of thee, and let me know per wire how ye get on." Well, my friend was not long in replying to the Exchange, when he met a gentleman who had for many years resided in Camborne, to whom he imparted the information he had that day received. Being very friendly with him, he thought if it was such a good thing he might as well partake of some of it; but what was his surprise when the late Camborne resident burst out laughing, and said, "Now, really, Verdict, are you so jolly green as to be had in that way? Why, that is an old game. Mind, if there is any loss you will have to fish for it." "What do you mean?" says Mr. Verdict Confident. "I certainly shall act upon his advice, and am glad I have not yet come to think so badly of my species." After buying a good many of the shares he did send a telegram, as requested, announcing the purchase and number bought, and when scarcely an hour had passed away he had a telegraphic message placed in his hands from his obsequious friend in the West countermanding the order, and if any shares were bought to get rid of them at once, and let him know his portion of the loss, if any, when he would send him a cheque in due course. The account was sent, but I regret to say the once resident of Camborne's words were proved too true, and my friend had to fish for his difference, and, from present appearances, is not likely to get a minnowy part of it back. My friend has not only to digest the loss he sustained on the partnership business, but the most vexing portion of the one-sided transaction is that, through this very valuable information obtained, it made him cling to the interest he already held, which was a tidy one, and, instead of making a handsome profit,

which he certainly would have done, his account shows a heavy loss. I will finish by proffering this advice: If you are asked to buy shares on joint account—don't! particularly with gentlemen who live in the West.

If by this feeble attempt at exposure I may be instrumental in frustrating the designs and machinations of such scoundrels as the Grabbal Neverpart, and preventing the Verdant Confidents from being entrapped, I shall consider myself amply repaid for writing this letter, and grateful to you for inserting it.

VERDANT CONFIDENT'S FRIEND.

[For remainder of Original Correspondence see to-day's Journal.]

THE PENALLT SILVER-LEAD MINING COMPANY (LIMITED)—FOTHERGILL'S CASE.

The decision of FOTHERGILL'S case on Jan. 24 by the Lord Chancellor and Lords Justices of Appeal adds another to the long *rolle* of sad cases that developes the Companies Act, 1862, and demonstrates how ruinous it is to sign legal documents except upon the soundest advice. The facts were these—On Sept. 30, 1869, Mr. FOTHERGILL and two others, as vendors, agreed with Mr. HEWITT to sell to him as trustee for the then intended Penallt Silver-Lead Mining Company (Limited), a mining property in Wales. The agreement also provided that so soon as such company should be registered, and the directors should legally accept and adopt such agreement, the vendors should assign to the company the before-mentioned mining property for 20,000l., payable as follows:—10,000l. in 5000 fully paid-up shares of 2l. each, 6000l. in cash on Oct. 30 then following, and the balance as soon as a dividend of 15s. per cent. should be paid by the company. Mr. FOTHERGILL signed the company's Memorandum of Association for 1000 shares; the Articles sent out in its appendix a copy of the above-mentioned agreement, and empowered the directors to adopt it. The company was incorporated on Oct. 9 following, and a copy of the above agreement was filed with the Registrar on Oct. 21. Mr. FOTHERGILL, Mr. HEWITT, and a Mr. CRAIG, another of the vendors, being directors by resolution, adopted the agreement, and thereupon the mining property was handed over to the company, but no assignment was executed. In November following, 1500 fully paid-up shares were allotted to Mr. FOTHERGILL, for which his name was inserted in the share register. Never throughout the company's existence was he treated as having a right to any other shares. On the company being wound-up the liquidator, under the Master of the Rolls' order, placed Mr. FOTHERGILL'S name on the list of contributories for the 1000 shares subscribed for by him in the Memorandum of Association, which had not been allotted to him, and upon which nothing had been paid, thus giving effect to the Companies Act, 1867, sec. 25, which provides that every share in any company shall be deemed and taken to have been issued, and to be held subject to the payment of the whole amount thereof in cash, unless the same shall have been otherwise determined by a contract duly made in writing, and filed with the Registrar of Joint-Stock Companies, at or before the issue of such shares. Mr. FOTHERGILL appealed from the above order of the Master of the Rolls. The Lord Chancellor, with the concurrence of the Lords Justices, in giving judgment on the appeal, said—

"The only question is, whether in law or in fact Mr. Fothergill has paid or satisfied to the company 2000l. in respect of the 1000 shares subscribed for by him. It clearly has not done so unless such payment could be made by the appropriation thereto of his interest as a joint vendor with two other persons of a mineral property which by an agreement annexed to the Articles of Association was contracted to be sold to the company. I assume that such agreement was binding on the company, and that it made no difference that the vendors were the company's directors. Still it appears to me to be quite clear that there are here two independent agreements. No connection between them is expressed on the face of any one of the documents. They take effect at different times, in different events, on different conditions, and between different parties. By the subscription to the Memorandum of Association Mr. Fothergill not merely agreed to take, but actually did take, and immediately on the registration of the company became the actual and legal holder of 1000 ordinary shares, in respect of which he was thenceforth liable, absolutely and unconditionally, to contribute to the funds of the company the full sum of 2000l. By the same deed, however, the other two persons jointly (of whom Mr. Fothergill was one) became entitled, not absolutely and immediately, but conditionally on certain events afterwards happening, to 5000 shares, without liability to pay anything upon them, the land, with which the vendors parted by the contract, being agreed to be taken by the company in lieu of the full amount of those shares. Shares cannot be set off against a money demand; a joint contract cannot be set off against a separate contract. To contend that, apart from any other or subsequent arrangement, Mr. Fothergill could, as against the company, insist on the extinction of his liability to pay them 2000l., in consideration of his renouncing, with or without the concurrence of his co-vendors, a part of the right to share without personal liability in the contingent profits of the company, would have appeared to me simply extravagant. Any stranger proposing to give credit to the company, who might have gone to the Registrar of Joint-Stock Companies, and might have there seen those agreements, must have understood (supposing, to simplify the case, that the whole purchase-money for the mine had been payable in paid-up shares) that the company would have assets to satisfy his claims as well, the mine itself free from any liability to any person which could come into competition with his rights as a creditor, as also the 2000l., either actually paid or legally payable on Mr. Fothergill's shares. The appellant says he ought, on the contrary, to have understood that one of these assets of the company was in effect to be set off against the other. Even if the whole had been payable in money the debt to the three could not, without more, have been set off against the liability of the one. Taking this view of the true construction of those documents, it would not have been easy to persuade me that if the Companies Act, 1867, had not been passed I should have been obliged to hold that Mr. Fothergill's liability to pay the 2000l. was extinguished or satisfied."

His lordship added that he had carefully examined "Drummond's case," "O'Fall's case," "The Regalia Hall Company's case," and "Jones's case," and he found that the question determined in each of them was one of fact rather than of law, and that they all differed from the present case, and he proceeded—But if these authorities went much further than they do in support of the appellant's argument, there would still remain the insuperable difficulty that the law applicable to the present case is different from that under which those cases were determined. The 25th section of the Act of 1867 applies to the present company, and was evidently enacted to put a stop to the dangers and abuses incidental to all such arrangements as those which I find in the above decisions. If there were in this case the clearest possible proof either by parol evidence or by an unregistered document, of an actual agreement that the shares which Mr. Fothergill subscribed for should be paid up by setting off against his liability on them the value of his interest under the agreement for sale in that part of the consideration of the mine sold to the company which was not payable in cash, this agreement (not being registered) would be absolutely void by the statute. The 1000 shares for which Mr. Fothergill signed the Memorandum of Association could not have been issued, and they could not have been held after issue, as shares payable in any such manner. I should certainly not have been able to do so. The words of the statute are, 'the words of the word "payable in cash," as used in this statute. But to hold that shares payable in cash under this statute can be paid for by an agreement to set off against them other shares deemed to be paid up in the same company (which the company could not lawfully buy, and of which the value must be wholly speculative), or even by ascribing to them the assumed value of land agreed to be sold to the company for any other than a money consideration presently payable for cash, would be to render this wholesome enactment absolutely nugatory. I think that the judgment of the Master of the Rolls in this case is right, and that the appeal motion must be dismissed with costs."

We have given the above luminous judgment at some length, as it teaches a valuable lesson, not only to Mr. FOTHERGILL, with whom we sympathise, but also to all those who, whilst affecting to have the law of joint-stock companies at their fingers' ends, blindly rush, and advise others to rush, into unforeseen liabilities that ultimately entail irreparable ruin.

IN RE THE HARMONY AND MONTAGUE TIN AND COPPER MINING COMPANY—SPARGO'S CASE.

Court of Chancery, Jan. 25. (Before the Lords Justices of Appeal.)

This case, which came on by way of appeal from a decision of the Vice-Warden of the Stannaries Court, involved a question somewhat similar to that which arose in Fothergill's case, but there was an important distinction between the two cases. This company was formed in 1871, to purchase and work a tin and copper mine at Redruth, in Cornwall, known as the Harmony and Montague Mine. The Memorandum of Association was signed by seven persons on March 3, and registered on March 9, 1871. The capital of the company was to be 3200l., in 64 shares of 50l. each. By the memorandum Mr. Thomas Spargo agreed to take 31 shares, two of the other subscribers agreed to take two shares each, and the other four subscribers agreed to take one share each. On Jan. 28, 1871, a licence to work the mine for a year from Jan. 25, 1871, had been granted to two persons, named Samuel Mitchell and Hugh Stephenson, with an agreement on the part of the lords of the manor, to whom the mine belonged, to grant a lease of it for 21 years at the expiration of the licence, or sooner if requisite, upon Mitchell and Stephenson producing to the lords a proper list of adventurers. Spargo entered into an arrangement with Mitchell and Stephenson to get up a company to work the mine, to whom the lease was to be sold. Spargo was to have half the purchase-money, and the other half was to be shared between Mitchell and Stephenson. On March 16, 1871, a meeting was held of all the seven persons who had subscribed the Memorandum of Association of the company. It was then resolved—"That the sum of 2176l. be credited Mr. Thomas Spargo for the lease, &c., of the property, and that the same be paid out of the share capital of the company." At the same meeting Mr. Spargo was appointed manager of the mine, and it was resolved that certificates should be issued to him for the 31 shares for which he had subscribed the Memorandum of Association, and also for 20 more shares which he agreed at the meeting to take. The company had possession of the property and worked the mine till December, 1871, when a winding-up order was made. Some difficulties had arisen about the form of the lease, and it had not been actually completed before the winding-up. All the shares in the company were registered as fully paid-up. At the date of the winding up only nine shares remained standing in Mr. Spargo's

name. It was in effect admitted that they were, in fact, paid-up, and that on section 25 of the Companies Act, 1867, which requires shares to be paid-up in cash, except it is otherwise provided by a written agreement registered with the Registrar of Joint-Stock Companies, made the supposed payment to the Vice-Warden held that there had been no payment, and made an order for Spargo to pay to the liquidator 4500l., and from this order Mr. Spargo appealed. Mr. R. Oxburgh, Q.C., and Mr. Woodroffe were for the appellant; Mr. Mr. Joseph Dixon were for the liquidator.

Lord Justice JAMES said that he thought the order of the Vice-Warden stand. The real question turned upon the true intent and meaning of the Act of 1867. The point which arose now did not exactly arise in *Spargo's case*. But the Lord Chancellor in that case said he was not dissatisfied with the narrow and technical construction upon the words "payment in cash" to be construed so as to lead to such an absurd result as that as checks would not be a payment in cash. His lordship's own view was that in an action of law would support a plea of payment in cash within the meaning of this section. The object of the present contracts for payment of shares in goods, or such bargains, was to give paid-up shares in satisfaction of money which was paid upon other shares. But if there was a bona fide debt payable in one side, and a bona fide liability to pay for shares at once in money, and the handling of bank notes by the one party and the handing by the other would have been a good payment at law, the lordship of 1867 in no way interfered with that. In such a case the shareholders pleaded payment to an action by the company for the calls. There was no fraud in the case, for every shareholder knew what was done, and the consideration for the payment had failed, as the lease was to the company. That would not prevent its having been a good payment, though there might be an action afterwards to recover the money for the profit derived by him from the sale of the mine to a limited company. Everybody knew that they were negotiating for a licence to work for a year, with a right to have a lease for a longer period. The directors afterwards were only as to the proper conveyancing language in the document should be expressed. The order of the Vice-Warden must be discharged. The costs of both suits to be paid out of the estate.

Lord Justice MELLISH was of the same opinion. If what was done was a payment at law, that would satisfy the words of section 25, thought that was so in this case. There was a payment in account, and the shares were settled by both parties, and the money was paid to the general rule of law was that if a matter resolved itself into the payment and the handing of it back, and the two parties met and agreed to a debt against the other, that would be payment.

THE ROMAN GRAVELS LEAD MINE, SHROPSHIRE.

Court of Chancery, Jan. 28. (Before the Lords Justices of Appeal.)

Murchison v. Southgate.—This was an appeal from a decision of the Master of the Rolls. The bill was filed by Mr. J. H. Murchison, a mining engineer in the city, against Mr. Tufnell Southgate, a solicitor in the Temple, alleging that he employed the defendant to purchase on his behalf a lead mine in Shropshire, the Roman Gravels Mine, and that the defendant, having obtained the knowledge thus acquired of the value and prospects of the mine, to purchase it on behalf of himself and two other gentlemen, Monday and Watson, and praying that the defendant might be decreed for the profit derived by him from the sale of the mine to a limited company, which it is now being worked with success. The question in the fact—whether the relation of solicitor and client existed between the plaintiff before or when the purchase was made. The Master of the opinion that the plaintiff had not proved his case, and dismissed the bill. The plaintiff appealed.

Sir John Karslake, Q.C., Mr. Fry, Q.C., and Mr. Waller argued the plaintiff's case. The Solicitor-General, Mr. Southgate, Q.C., and Mr. Williams appeared for the defendant, but were not called upon to argue. Lord Justice JAMES said that in the whole course of his long experience never seen a case so utterly devoid of foundation, either in law or in fact, as the case stated by the plaintiff, his lordship could not understand how Mr. Southgate to Mr. Murchison was of which he was said to have been a breach. His lordship believed that Mr. Southgate was telling the truth, and he thought the decision of the Master of the Rolls was a just one, and must be dismissed with costs.

Lord Justice MELLISH was of the same opinion. He agreed with the Master of the Rolls, that the plaintiff had made out his case, in kind and in the duty of the plaintiff to prove the fact of the relation of solicitor and client, and in his lordship's opinion the plaintiff had failed to do so. He had not proved that the defendant ever acted as his solicitor with the Roman Gravels Mine. The appeal must be dismissed with costs.

MINING IN THE HIGH PEAK OF DERBYSHIRE.

Capt. JOHN COLLINS, of the Peak Forest Mining Co., has forwarded us the following information respecting a new discovery on this property:—

Jan. 24.—The shareholders of the company will be glad to learn that the new vein, running nearly from east to west, has converged into their original vein, contains an exceedingly rich lode of ore. This is in itself another reason that of the above company. The directors have freed the same from the Master, and given notice to enter it in his books as belonging to them. It is named the Seaton vein; they intend to work it in conjunction with the present mine.

They (the shareholders) will also be glad to learn that the No. 10 level, which has been strengthened, and conductors put in from the Seaton vein, bottom level—i.e., 200 yards deep. This being done, two to three times the quantity of ore can be drawn with the same amount of steam power as before. The dam-head in the manifold valley over which the water flowed from the mine on June 18, 1872, has been raised and puddled and strengthened. This, I believe, will prevent the recurrence of such a disaster, unless, perhaps, heavier floods than any we have had of late. The great downfall of 1872, in the latter end of May last, has kept the ore-producing ground under water for months. Notwithstanding this, a great amount of really good work has been done. The timber had decayed, and the roof of the 40 had in many places fallen in, and has been repaired, and new timbered for fully ½ mile. This level, 230 ft. below the old miners about 100 years ago. It is of great value to the present mine, being an outlet for the water; it thus saves the cost of pumping water, and 40 fathoms.

The new directors immediately abandoned the old system of Derbyshire, and began to arrange for working on the principle now adopted at the Seaton vein. The new mode of working will in a few months be fully established that three or four times the number of ore, given to the company, may work with much more comfort to themselves, and to the profit to the company. The sinking of the new shaft has been carried to the depth of 5 yards below the new or bottom level, at which level produces in its quantity and quality equal, if not superior, to the ore of the present mine. I am glad to be able to state that the directors have determined on this sinking with all possible speed, and rapidly develop the mine, the value of the mine. The length of ore-bearing ground proved at the level, from No. 8 to the extreme workings in the new level at No. 10, is considerably over 600 yards. The bottom level is being driven, and is now at a depth of 18 yards below the old level, and is now producing fully 2 tons of ore per fathom. I shall be glad to give more details of this resuscitated promising mine on a future occasion as the work proceeds.

TRETOIL TIN AND IRON MINING COMPANY.

The managing director has just returned from a visit to the mine, and has presented the following report to the board:—

I have just completed my third half-yearly inspection of the Tretoil mine, and being the first inspection since the transfer of the property to the Tretoil Co., I may be well to embody my observations in the form of a report to the board. We have a substantial two-horse whim (which will soon be replaced by a winding engine), changing house, smithy, house, and joiners' shops, complete set of Cooley and Co.'s weighing-machines and house, and all the necessary roads for conveying the iron and tin ores to the respective tips. The roads and buildings are all in good order. Underground in No. 1 level, the iron lode opened, as described in Capt. Hooper's report published under the auspices, and the tin lode opened for nearly 50 fms., with an average yield of 16l. per fathom. The tin lode is standing open at the surface, and is making allowance for the underlie; the lode from the surface down to the tin lode will have a depth of about 23 fms., and with the exception of the tin lode, the whole of the ground taken away by the last year's excavations made by former workers, the whole of the ground is now open to the surface. In No. 2 level the lode is being driven by Capt. Hooper, and the whole of the lode is standing going west to the boundary of the mine. The east lode is 12 ft. wide, and as far as can be ascertained is a continuous lode. In No. 3 level the iron lode is opened out for a distance of 100 fms., and is standing open at the surface, and is making allowance for the underlie, with a good lode going east fully 12 feet wide. I had samples taken from down from all three levels, the detailed values of which I shall give in my report.

GENERAL REMARKS.—It will be noticed that in No. 1 level the tin lode was ascertained, about twice the width of the lode in the other level, and an explanation of this is probably that in going down it has split into the tin lode—a not uncommon occurrence, as I am told. We are at present in the case, and if it is found to be as we expect it will add very considerably to the reserves, to which I propose to refer later on. The tin lode, being east in No. 1 level, is being continued, and according to the appearances bids fair to become a most important point in our operations. The value of the ground driven to within a few fathoms behind our present workings, at the level of 16l. per fathom, it then increased to 20l. per fathom at the level of 18l. per fathom, and from the end in my presence gave, as will be seen, a value of 30l. per fathom. It is clear that if this rate of improvement continues, a few fathoms further we shall have an exceedingly rich piece of ground, and that it will continue to be very valuable, judging from the value of the lode. At my request Captain Hooper made a careful estimate of the tin lode, and he calculated that we have at least 10,000 tons of tin ore, and ready for taking away, without taking any account of the tin lode, which we are in hopes we shall shortly be able to take. I have taken the figures, and consider that the estimate is as near correct as it can be. This shows that, as far as it is possible to judge, we have substantial tin ore actually laid out to us, with an output of 50 tons a day, for the next year, and out any further explorations whatever. The ground laid open is more than one-fifth of the set, so that it is clear we must lay out a larger output than we have hitherto contemplated. In addition to the tin ore, which we are in hopes we shall shortly be able to take, we have a large output of tin ore, which we are in hopes we shall shortly be able to take, and if I am not much mistaken we shall find when the tin ore is

The CHAIRMAN said that it was thought desirable that the secretary should address the meeting at length as he had been so recently

In my setting up the month before last I find, however, the best way to cut the ground for the eastern plat as we are sinking, and will, of course, interfere with the bargain. Judging from experience, I think it shall be able to sink at least 20 ft. below the surface. I have divided the shaft into two levels, one 20 ft. below-plat and barrow road, and penthouse fixed in the 30 ft. level has been driven south-east of Pressure shaft 15 fms. 38 ft. in the present end is 2 ft. wide, worth 10¢ per fathom; driving 17. 15¢. per fathom. This level has been driven north-west of Pressure lode in the present end is 18 in. wide, worth 6¢ per fathom; driving 17. 15¢. per fathom. The 20 has been driven south-east of Pressure shaft 13 fms. 4 ft. due to the smallness of the lode being insufficient to drive 2 men; in the present end is 2 ft. wide, worth 10¢ per fathom; driving four men, at 4¢. 10¢. per fathom. The 20 has been driven south-east of Pressure shaft 13 fms. 5 ft.; lode in the present end is 1 ft. wide, saving work by six men, at 6¢ per fathom. This level has been driven north-east of Pressure shaft 3 fms. 1 in. in the present end small (suspended). The 20 has been driven south-east of Pressure shaft 13 fms. 5 ft., below the 20, very kindly in appearance, producing some rich stuff worth 5¢. 7¢. per fathom; driving by two men, at 6¢. 10¢. per fathom. I state that this is West Great Work great north lode, from which the value of their tin has been raised. We also worked on it some distance towards the extremity of the sett, at Paul's shaft, where we raised the amount of ground opened; seeing what has been raised, and for the economic and arrangement of the mine, we have decided to open the second level. I do not think it too much for us to expect something from this lode. The deep pit level has been driven south-east of Pressure shaft 1 ms. 1 ft. 6 in.; lode in the present end is 18 in. wide, saving work by four men, at 8¢. per fathom. There is about 10 fms. more to get into the run of tin ground driven through at the shallow level, we have sunk a winze from the 20 to the 30 south-east of Pressure shaft 10 to the 30 north-west of Pressure shaft 10, and the 20 has been driven south-east of Pressure shaft 10, the deep pit level has been driven south-east of Pressure shaft 10, the deep pit level has been driven south-east of Pressure shaft 10, the deep pit level has been driven south-east of Pressure shaft 10.

James, 1, King's Arms yard; E. C. Jackson, 54½, Bishopsgate-street; and James Barker, 242, Oxford-street, Stepney.

Royal School of Mines, Jermyn Street.

GEOLOGY—LECTURE I.

A Course of Lectures on "Lakes, their Origin, and Geographical and Geological Distribution" is being delivered on Monday evenings at the Geological Museum by Prof. RAMSAY, F.R.S., Director-General of the Geological Survey of the United Kingdom.

"Freshwater Lakes, their Origin, and Geographical Distribution" formed the subject of his first lecture. This is a subject not often treated of in any manual of geology, but the course of my researches for a number of years has led me to consider it. There are many kinds of lakes in the world, produced by different agents. In all regions where there are extinct volcanoes in the craters of the volcanoes after the fires have ceased, the drainage of the slopes of the crater is apt to originate lakes, and sometimes in craters formed of solid lavas, sometimes in craters composed chiefly of volcanic ashes, as in many parts of Germany you find lakes. I have often been unjustly charged with stating that lakes are formed by an agent against which I wish to impress now, because it is far from being the case. In those constant oscillations of level taking place between land and sea, the land being lifted unequally, and parts of great continents sometimes subsided, in such hollows you find lakes, but these are not the lakes I am going to speak of to you about to-night. I am going to speak of another kind of lakes which have been produced not by volcanic agency, not by the elevation of sea margins, not by the sinking of continents, but by the erosion and grinding out of portions of the surface of the earth. In some parts of the world the lakes are so numerous as to be almost innumerable, at least uncounted; thus, in Wales, are many little lakes; in Cumberland, still more, and larger in proportion to the size of the country; they increase as you go north into Scotland, till in the Highlands they occur in scores and hundreds. In like manner the whole of Sweden, and the North of Russia, are strewn with lakes; and while they are few to the South of the Himalayas, to the north of that range they are found in great numbers, from the Caspian to the Pacific through the middle of Asia, many of them fresh, some of them salt. Again in North America, from about the parallel of 43° N. up to Hudson's Bay they are almost innumerable. Some of them lie in hollows in a mass of clay containing a number of stones called by geologists "boulders." Others lie in basins of rock entirely surrounded by lips of rock. How were these hollows formed by Nature? The stratified rocks which compose a very great part of the earth's crust were first deposited from water approximately horizontally, and have subsequently in many cases been disturbed and broken lifted into folds, so that some strata lie inclined at high angles, and are much twisted and contorted. And it very frequently happens that great fractures take place in these stratified rocks, and the result is what are termed faults, where one side is often thrown down below the other, and thus a great sea of 50 or 100 miles long, and 3 to 5 miles broad, might be formed. It seems to me absurd to say that lakes hollows frequently occur in these faults, because in all the faults I have seen, and they are very numerous, the sides of the fault are either close to each other, or only a yard or two apart, and then often filled up. Some maintain that the waters from the drainage will stand in the synclinal hollows, or downward folds, of the strata, and thus a lake or series of lakes is formed. But in all countries that have been violently disturbed—e.g., the Scotch Highlands—you never get this simplicity of curve, for the disturbances which produced these curves having been in action at an early period, denudation by atmospheric agencies, by rivers, and perhaps by the sea, have removed much of the curved strata, and perhaps there is not a sign of the original curve except in such strata as lie deep underground. Also the theory that each lake has been formed by a special area of subsidence seems to me, when you consider the thousands and tens of thousands of small lakes that occur in North America, a country almost flat, or with only low undulations, and that they occur in some case a mile or less apart, to require a special area of subsidence for each one of these lakes seems to be an absurdity. Again, a lake cannot make its own hollow, there is no motion or rest to no motion in the water, its waves can waste the coast and make cliffs, but cannot deepen the area. The streams which flow into lakes carry with them mud and sediment, and tend to fill up the lake, and in the long run every one of these lakes must inevitably become filled up in this way. Rivers cannot make lake hollows, all that rivers can do in running down a slope is to scoop out a long narrow channel, and they will go on widening and deepening this channel, but that a river should make a deep hollow is physically impossible. Neither can the sea breaking upon the shore make lakes; its action is to wear back the cliffs and form a plain just below its level, which is called a plain of marine denudation. Nor can the waves of the sea excavate the hollows, for the waves effect a waste of the land, what other agency remains to us but that of ice by which we can account for the scooping out of these lake basins?

In Switzerland, where the mountains rise 14,000 or 15,000 ft. above the sea level, and where the limit of perpetual snow is 5500 ft., the snow falling on the upper slopes above that height will accumulate in the valleys, and by force of gravity it will force its way down into the valleys beneath. By pressure from behind the accumulating mass will be forced on, and by virtue of its own weight it will become converted into a solid ice, so that in course of time a great stream of ice flows down the valley, so to speak, like a solid river. In this diagram of the Rhone glacier you have a case in point; it flows down on an average about 200 yards every year. Blocks of stone of all sizes fall down from those parts of the mountain which are so steep that the snow cannot lie upon them on to the surface of the glacier, and are by it carried on to the end where the ice is melting, and there they form a "terminal moraine." Some glaciers are known to be more than 500 or 600 ft. thick, and the result of such an enormous weight of ice passing over the rocks must be to destroy the roughness of the floor, and to wear off the asperities, and thus the floor of rocks becomes smooth and mammellated, as the French call it, the "mamelles." It is known that all these glaciers were formerly much larger than now, and accordingly we find this smooth and mammellated structure on both sides of the present course. Numbers of cracks exist in the mass of the glacier, and stones falling into these come to the bottom of the glacier, and becoming fixed there groove and polish the rocks, and are themselves grooved and scratched. Further north and south similar phenomena occur on a larger scale. Greenland is covered with a universal ice sheet, often of unknown thickness; it is, in fact, one great glacier, the ends of which extend into the Arctic Ocean. Cliffs of ice there rise out of the sea to the height of 100 to 150 or 300 ft., and it has been recently proved by soundings that at the extremity the ice is sometimes no less than 3000 ft. in depth. Large masses of this ice, sometimes three or four miles in circumference, break off and float away as icebergs, in many cases loaded with great quantities of stones and moraine rubbish, which they deposit on melting at the bottom of the sea. These icebergs are met with in Baffin's Bay, along the East Coast of North America, as far as the latitude of New York, and sometimes as low as the Azores. In the southern hemisphere a similar state of things occurs.

By a process of observation and reasoning we arrive at the conclusion that this glacier action was at some previous period of the earth's history much more extensive than at present. We know of no other agency which can produce those peculiar striations, except that of ice, and, therefore, wherever we find them—as we do in Scotland, the Jura, and many other places where glaciers do not now occur—we are justified in attributing them to glaciers, and in believing that land to have been once covered with a mass of glacier ice. Thus, the Alps, the Vosges, Black Forest Range, the mountains of Wales, Cumberland, Scotland, and many others in Europe, show signs of this action, and when we examine the country adjacent they also bear similar testimony. Thus, over the whole of the North of England, over the whole of Wales, the greater part of the North of Europe, the northern part of North America, on the shores of the Niagara, and over the United States, wherever the surface soil and the accumulations of clay are stripped off the rocks are found to be striated. Thus, the whole of North America appears to have been covered with a sheet of universal ice, and when the country gradually sunk below the sea, the mountains above the water supported a system of glaciers, which furnished icebergs, and thus extended into the sea, and when the country rose again, from about the neighbourhood of Cheltenham, right into the interior of Scotland, is covered with a similar deposit of clay, which sometimes contains shells of living species, but not of species now living on our shores, but inhabitants of cold Arctic regions.

This boulder clay deposit is sometimes so situated as to have dammed up a stream of water, and thus formed a lake; in cases moraines have dammed up similar lakes, while sometimes the moraines remain in a circular form, and the glacier is represented by a stream of water, and thus again a lake is dammed up. But lakes of this description are not very numerous, and are not of any great importance. These lakes, surrounded by lips of solid rock, I maintain were scooped out by the grinding power of glaciers. This theory was first presented to me whilst observing in North Wales. There I found a number of rock basins of small size, and how to account for them very much puzzled me; but it occurred to me that the pressure of the ice, especially in areas where the rocks are of unequal hardness, might account for it, and so I ventured to attribute a great number of the tarns on Snowdon to this cause. I went to Switzerland and saw larger lakes, and then I ventured to attribute the origin of these larger lakes to the same action, for all were in areas of great glacial action—Lake of Geneva, &c., in Switzerland, and the great Italian lakes, &c. I carefully ascertained that they were in the main truly dammed up by surrounding lips of rocks, and then I applied the theory, especially to the south of Geneva. This lake is 955 ft. in depth nearly in its centre; it is shallower near the end of the delta, on account of the mud brought down by the Rhone. Where the glacier entered the upper end of the lake it could not have been less than 3000 feet thick, as appears from an examination of the mountains on either side. The rock underneath the lake is of a comparatively soft character, and where the ice was thickest there the grinding power, I believe, was the greatest, and the result was that it scooped out a deeper hollow in this part of its course, as though the farther end of the lake, where the glacier had grown less through melting away, the grinding action was less. When an amelioration of the climate took place, the great hollow was filled by the waters of the Rhone, and the Lake of Geneva is the result. In every one of the great glaciers of Switzerland the lines in the valley prove that during the glacial epoch it must have flowed down the valley, and it is in these valleys that there are these great lakes, and a great number of small ones besides.

Some of these lakes are of great depth: Lake Maggiore is 2900 ft. deep, and its surface is 600 ft. above the level of the sea, hence its bottom is much below the sea level. I maintain this is no argument against the theory I have put forth, for a large mass of ice would block out the sea, and still go on grinding, although the sea beat against the glacier; and although the lake is so deep the slope from the deepest part to its present outflow is not so great. It is a proved fact that a glacier has the power of forcing itself over minor undulations, and the slope in the Lake of Geneva is not more than half a degree, whilst in the extreme case the slope will not be more than 2 or 3°. We must remember the enormous propelling force of the mass, 5000 or 6000 ft. in thickness, pressing down a slope, perhaps six or seven miles long. This is in the main the theory of the grinding power of ice to form those rock basins which are so numerous in the northern hemisphere, and observation bears out its truthfulness. In North Wales, for instance, there are signs everywhere of the action of ice in former periods, and in this district there are numerous lakes, never of large size, the largest being Lake Bala, 4½ miles long, and the next largest near Snowdon from 1 to 1½ mile in length; all of them in the course of ancient glaciers. Windermere, the largest lake in England, lies in a true rock basin, and many of the others in that district which I have examined also do. In the Highlands of Scotland, where the climate was more severe, and the glaciers larger, there are a number of larger lakes, Loch Lomond being 25 miles long, and a great number of these again lie in true rock basins. The whole country seems covered broadcast, so to speak, with lakes, and there is the strongest evidence of ice action. In Sweden and Norway, again, the lakes are almost innumerable, in Finland, North Russia, and on a large scale in North America, and in the opinion of many geologists those in America lie in true rock basins, and it is quite certain

that they are surrounded by lips of hard rock. Just in proportion to the intensity of glacial action do the lakes become more and more numerous, and I believe the scooping out of these innumerable lakes were due not to special glaciers, like those now on the southern flanks of the Alps, but to that great ice sheet of Agassiz which covered more than the whole of the northern half of Europe, and to that which covered the greater part of South America, and which also produced lakes. If we pass to New Zealand and examine the glaciers of the present day we find they are pigmies to what they were at a previous age, and in the course of every glacier we find lakes lying, and I know from reports I have received that here also the lakes lie in great rock basins.

UTILISATION OF SMALL COAL.

The enormous advantages to be anticipated from the more extensive utilisation of small coal, now that round coal is at such an excessive price, cannot be doubted, and as the processes patented by Mr. DAVID BARKER have thoroughly fulfilled the most sanguine expectations that could have been formed of them, the energetic development of the inventions would appear to be in every respect desirable. To accomplish this object an influential company—the Diamond Fuel Company—has been incorporated with a capital of 200,000l., in shares of 5l. each, to acquire and carry on the works now in the hands of Messrs. Barker and Clare, at Stratford, Essex—a situation particularly favourable for a business of this nature. The process, with which most of the readers of the *Mining Journal* are familiar, it having been in successful operation for some time, consists in the conversion of slack or duff, coal dust, or small coal, into solid and compact blocks in combination with ingredients which render them actually superior as a fuel to the lump or screened coal itself. Indeed, a better evidence of the value of the fuel could scarcely be wished for than that afforded by the circumstance that recent and continued trials of "Barker's Improved Fuel" at the Royal Arsenal, Woolwich, on the North London and Midland Railways, by the Iron Steamboat Company, at the works of Messrs. Maudslays, Sons, and Field, Messrs. Brandram, Brothers, and Co., and other eminent firms, have given perfect satisfaction.

Although the profits realisable are, of course, larger when lump coal is at a high price than at other times, the raw material is obtainable so cheaply, and the process of manufacture is so simple, that there would be a good margin with coal at one-half the present rate. It is estimated that many millions of tons of small coal are wasted annually owing to its being unsuited for treatment by the other methods, and as this slack is purchasable at a comparatively trifling cost, and as coke dust, peat, &c., can be largely and advantageously employed, the supply may be considered practically inexhaustible. The machinery used in the production of the diamond fuel is almost entirely self-acting, the material being scarcely touched from the time it is first lifted to the machine until it is ready for the market; and as it is intended to establish works and depots at Liverpool, Hull, Swansea, Newcastle-on-Tyne, Sunderland, &c., the expenses of carriage both for raw material and marketable fuel will be reduced to the minimum. The directors propose also to secure a further source of income by granting licenses to colliery proprietors and others to manufacture for themselves upon payment of a royalty, proposals of this nature having been already received from several important firms and companies, both at home and abroad, based upon terms which cannot fail to be highly advantageous to the company.

It may be mentioned that among the recent improvements introduced in the manufacture of the diamond fuel is the shaping of it into spheres when desired, that form having been proved by experience to have the advantage of securing a free circulation of air amongst the burning, and thus very perfect combustion. The principle of manufacture, moreover, differs essentially from that of all other artificial fuels, the use of great heat and great compression being avoided, and cohesion being obtained by means of a binding liquid, which while aiding combustion ensures much greater tenacity; this principle appears to be that alone applicable to the agglomeration of anthracite waste; all previous efforts to deal with this class of small have ended in disappointment, but anthracite small manufactured into diamond fuel has been found to evaporate nearly 13 lbs. of water for each pound consumed, thus proving actually superior to the large coal from the same seam. Diamond fuel lumps from Welsh steam coal, Irish and Welsh anthracite, coke-lust, and smokeless coke fuel, have been systematically examined by Prof. E. V. Gardner, of the Royal Polytechnic Institution, and the results obtained are in every respect satisfactory. The fuel is very dense, the percentage of ash is small, the sulphur does not in any case exceed that of the coal from which the fuel is made, and will not fall or disintegrate before a blast or strong draught, but forms into coke; it does not produce clinker unless the coal used be very impure, whilst with regard to stowage, a ton of the block fuel occupies only from 25 to 31 cubic feet against 47 cubic feet, which is the approximate measurement for a ton of coal.

That there is, especially at the present time, an extensive field for the sale of artificial fuel of the high character indicated above cannot be doubted, and as the board of the new company is an influential one, and the present proprietors of the patents have undertaken to further the interests of the undertaking either by joining the board or placing their services at the disposal of the directors; there would appear to be no reason why the enterprise should not prove highly remunerative.

IMPROVEMENTS IN BRICK MACHINERY AND MANUFACTURE.

MURRAY & CLAYTON.

For three reasons this long-pending patent case merits notice—First, because its general importance requires its progress to be duly laid before the public; second, because the delay in its settlement is preventing other brick-machine manufacturers from improving their machines; and, third, because it will soon become the duty of the trade to interfere, either directly or indirectly, so as to put an end to a dispute which ought never to have existed. The facts are these:—Mr. Murray obtained a patent for a cutting-table, No. 1581, June 8, 1866. A Mr. Burdett obtained a patent, No. 2762, 1868, for a cutting-table, somewhat similar in appearance, which, by purchase, became the property of H. Clayton, Son, and Howlett, of the Atlas Works, London, W. Murray files a bill of infringement against H. Clayton, Son, and Howlett. Vice-Chancellor Sir J. Bacon, Jan. 13, 1872, after nine days' hearing, gave judgment in favour of the defendants. The Lords Justices, May 6, 1872, reversed this decision, and gave an injunction in favour of the plaintiff. This decision of the Lords Justices is not yet finally settled, the defendants, besides objecting to its formality in detail, having taken the necessary steps with the view of bringing the whole case under appeal before the House of Lords. It would be premature to anticipate the judgment of the Supreme Court. Not so that of the better informed members of the trade, for they conclude that the dispute must eventually end either in a disclaimer by Murray, or also in the setting aside of his patent altogether, owing to the manner the rights and liberties of the subject are interfered with. Hence, the movements of this case in Chancery are being watched with the deepest interest, not only by the trade, but by patentees and the public generally; and what increases the intensity of the excitement is the unexpected course into which things have drifted. For example, H. Clayton and Son applied June 1, 1872, for a patent (No. 1664) to cover a new improved cutting-table, very different in its mechanical combination, operation, and results from either Murray's, Burdett's, or any of the many similar cutting tables which have been in successful use in the brickfield. Murray opposed the sealing of this patent. The Solicitor-General, however, after hearing both parties, decided in favour of Clayton and Son; and their patent (No. 1664) has just been sealed, a month extra being allowed them to file their specifications, and so on. And this, too, is not all, for the most reprehensible proceedings against the Atlas Works have yet to be told—a motion by Murray in Chancery to bring the new cutting-table, made according to Clayton and Son's patent (No. 1664, 1872), under the Lords Justices' injunction, with the view of incarcerating the firm of H. Clayton, Son, and Howlett! Had such a side blow been allowed in Chancery a twofold result would, no doubt, have been secured by Mr. Murray; and those who make his tables—the Messrs. H. Clayton, Son, and Howlett—would, in the first place, have been restrained not only from making Burdett's tables, but also any more of their tables; whilst, in the second place, they would have been compelled to settle,

in favour of their opponents, all other pending questions of imprisonment. But Vice-Chancellor Sir J. Bacon, after hearing, very justly refused the motion. In his judgment the Chancellor noticed with much clearness the rights of the rights of the two parties opposed to each other in the far the rights of the trade and the liberty of the other in the were involved; and how such rights and liberties were sacrificed were such a motion as that demanded by the granted. His language on some points was very forceful. "Nobody will contend that the injunction of the Lords Justices in the fourth case your trade and never make another brick-making machine not under any circumstances copy, counterfeit, or imitate, in the that combination, not that machine, but that combination which is the plaintiff's machine. To that extent, and that extent only, the the injunction apply. The question, therefore, comes before the court—Is the defendant, who is a lawful manufacturer of brick-making liberty to make a machine which does not present the combination which the plaintiff has established his exclusive right?"

It would require a drawing to give an intelligible idea of Clayton and Son's new table. Suffice it to say that it is a less number of hands than any of the many preceding tables might be quoted, in which the board and bricks had to be to the barrow by hand, and is particularly distinguished by one of its capabilities it possesses—of delivering bricks on to the barrow without lifting the bricks by hand, the economy of manual labour. And what merits special notice is that this is done without any augmentation of the cost, which is little more than half that of Murray's (No. 1581) table. During the hearing it came out in evidence that the defendants were selling more tables than the plaintiff understood the counsel for the plaintiff. From this it follows that the general public as well as an interest in the validity of Clayton and Son's patent (1872) being upheld.

MINES AND MINING IN THE UNITED STATES.

The annual meeting of the National Association of Mining Engineers has just been held in Philadelphia. Many factors have just been held in Philadelphia. Many factors were represented, and the assembled ironmasters expressed expectations of an unusually prosperous year. The secretary exhibits a very satisfactory state of affairs, and it attributes to the wisdom of the protective system, its statements, it appears that 105 new blast-furnaces were erected in the year 1871, and that 29 others will be built this year. Besides this, almost all the existing works added improved machinery, and increased their productive capacities. Ten new rolling mills were erected in the year 1871, and 29 others will be built this year. Mr. Danks, the inventor of a machine for puddling iron, was the guest of honor, and he delivered a long address explanatory of the system of his invention. He has lately returned from England, where at first with considerable opposition, he says he succeeded in introducing his furnaces. He believes there is a fair prospect that his invention will be adopted in England. In this country his furnaces are in some cases in Tennessee, and at the Millville Works, Pittsburgh, a new mill, intended to contain five of these furnaces, has just been erected, and will cost \$500,000. By this invention Mr. Danks expects to supersede the system of puddling by hand labour, and so reduce the cost of iron. The ironmasters who are not interested in the coal mines of Pennsylvania, what discomposure by the action of the leading capitalists of that State, have formed a combination for the purpose of advancing the price of a dollar per ton. The independent colliery owners generally oppose this combination; but as the latter own the bulk of the mines, they control all the means of transportation from the coal country, and opposition to their plans will avail but little. Very large quantities of coal were purchased last year by manufacturers in anticipation of an advance in the price of coal. The new coal trade with the West Indies and South America last year in consequence of the security and cheapness of English coal, is estimated to increase and become permanent. The American coal in those parts, which it is said a fair trial of the coal and consumers there will henceforth be steady customers; and the trade has now been deflected towards the United States; it is expected to lead to heavy and varied transactions in general merchandise and minerals.

A sketch of the industrial expansion now going on in the States is presented in a recent commercial report drawn up by the British Embassy at Washington. The report says:—"The astounding increase made by the United States in spite of its loss of its ocean commerce, and its shipping interests, can possibly be best shown by the simple facts. The wealth of the United States in 1850 was \$1,150,000,000, in the year 1860, and \$7,135,799,288 in 1870. With reference to the production of the precious metals, the report states:—"The 13 leading mines on the Comstock lode alone have produced, from 1861 to August, 1871, \$4,355,000, and this, too, without the aid of the smaller mines, now being partly corrected. It is estimated by competent judges that there now accumulates in the various western mines of precious metals, an amount of \$10,000,000, which during the spring and early summer will be shipped abroad. Even the Llano Estacado, a barren steppe desolate long the terror of travellers to the Pacific, has lately been discovered to be a mineral wealth."

Some figures are given showing the enormous yield of iron, and it is stated that its utility is about to be further extended by the discovery of the smelting of ores. The results of recent surveys of iron and iron deposits in the West and South that it is difficult to estimate.

GOLD IN NEW SOUTH WALES.—Mr. R. Adams (Spring Creek) writes:—"No doubt English attention to our mineral resources principally on our Hawkins' Hill reefs, where claims to the value of £1 in length are yielding over 100,000l. per annum; but the various and wonderful wealth of this colony, a new bearing deposit has lately been opened up which, though bearing about 7 dwts. per ton, bids fair to rival any other world in dividends, as proportioned to capital sunk in it, rather mines (as the lodes belong to three different parties). It is situated near Carevar, in this colony, and the first one of the lodes was originally a farm, the rich volcanic soil of which was sold for 12 years before its gold-bearing nature was ascertained. It was at once pegged out by its claim. This led to others doing the same, and a large lode or dyke of the extraordinary width of over 200 ft. of length some hundreds of yards, was sunk upon, and proved to be a crushing battery erected by the owners; and as the total cost of sinking and crushing the stuff is all done for less than 4s. per ton, and the practically inexhaustible, the lucky owners look forward to handsome returns. So heedless have we in Sydney been about our mine that we have not even yet secured a geological survey of the mine and its wonderful formation and extent. As a result of the scientific men have visited it, and opinion seems divided as to whether it is a burnt, blackish brown clay and gravel cemented with bands of pale-green friable material, with here and there different and right through the centre of the mass a reef crops up, like a 12 ft. thick, composed of 'hornstone,' intersected with conglomerate, in which specks of gold are freely seen, while the whole is a delicate green colour, almost opalescent. The lode is not only to be seen, but the extraordinary mixture, I picked out a 'rough' of the heaps. As the sun shines on the sides of the main working 100 ft. across, by 70 ft. deep) the delicate gradations of colour, cut down, are a beautiful picture; and wherever a piece is dug the specks of gold, or its colour, can be seen."

Some enterprising capitalists have given 10,000l. for one third of the mine, and are putting up a battery of 50-head stamps, which will be in operation by the end of the year, and is expected to average about 40,000l. per annum. The lode gets evidently richer with depth. On the opposite side of the lode, called the Brown's Creek lode, are also at work, and a lode, for over 300 ft. wide, right through 111 acres of ground, and other farm for about the same distance, where it seems finally to be a different kind of rock and earth; so that altogether this extraordinary lode is traced with a slight curve and a general north-east bearing, proved to be by 300 ft. wide, but as only one granite foot, of the lode is found, it may be very much more, and at 110 ft. in depth, and more plentiful. Competent miners and engineers are now at work, and others say that nothing like it has ever been previously discovered, and cannot even guess how many years it will take to work out, and three companies put up 50 head batteries; but (although I am not myself, and therefore deeply interested in the pecuniary result of my friend, the Rev. Mr. Clarke, that it is principally as a great curiosity, that it should receive public notice; and I trust that should any traveller read this he will not forget to pay it a visit, in the geological science, should he come out here.)

Day by day brings us news of fresh gold, copper, and tin discoveries that we have awakened up from our apathy we are not likely to be Brown's Creek is as yet unrivalled in the magnitude and peculiarly and I believe likely to remain so. Still, now it is found to be only the key to discovering other like deposits, and for the sake of the subject will excuse the lengthy treatment of it."

PORTABLE AIR COMPRESSOR.—Messrs. SIMPSON & WALTON, have patented a portable air compressor worked by power. The invention consists in compressing air for working other machines by means of a portable apparatus, consisting of a foot board passing around drums in which are crank pins for air cylinders, the chain of foot boards being driven by cattle or man.

FOREIGN MINING AND METALLURGY.

of iron are hardening every day in Belgium, especially for
which is steadily becoming scarcer. The advance in the Eng-
land state of affairs is not sufficient to explain a report that a
Charles firm has concluded some important contracts with
works in the Ardennes for the purchase of all the refuse which
works have been accumulating for several years past. The
price is said to range between 10s. and 52s. per ton, so that the
cost of transport is taken into account this refuse costs as
minerals. The statements current as to these reputed pur-
of Ardennes minerals lack, however, confirmation. The Acoz
has just purchased about 15 acres of land at Châtelaineau,
view of erecting there some blast-furnaces. The Cockerill
and Herr Krupp, of Essen, are stated to have purchased
iron minerals in Spain, with a view to the production of Bes-
semer-steel. Plates are quoted as high as 18*l.* per ton. Rails
some demand, but few transactions have been concluded. A
great deal of attention is at present being directed to an approaching
of rails for the Belgian State lines, as in consequence
failure of preceding adjudications, and the advance in quota-
tion of England, favourable terms are now anticipated by Belgian
minerals. The Syllie-Pauwels forges are stated to have been pur-
by a new company, which only awaits the promulgation of
the companies now before the Belgian Senate, in order to com-
mence operations, and prosecute them regularly. The capital is
have been entirely subscribed. The Syllie-Pauwels Company
has acquired a well-deserved reputation for the production of fine
and the new company proposes to continue this branch of the
which it takes over. The employment of puddling-furnaces
Dunkirk system is now under the consideration of the direction
company.

the Paris copper market copper has not shared in an advance which has taken place in other metals. Chilean bars is quoted at £10 in ingots, 98½; tough English, 96½; and Corocoro minerals, 100. At Havre there has been no transaction of importance. The Marseilles market copper has been advancing, Spanish tin having made 84½ per ton for consumption; ditto small rollers, 82½ per ton. In Germany quotations for copper have improved with firmness. Tin has further advanced upon the German market. Banca has realised 87½ fl., and Billiton 84½ delivered at the spring sale has been dealt in at 85 fl., and under sail at 83 fl. to 84 fl., according to the probable period of delivery. At Paris tin has been advancing. Banca, delivered at Havre or Paris, has brought 162½; Straits ditto, 156½; and English, sold at Havre or Rouen, 153½ per ton. The German tin markets are well maintained, and prices remain firm. Transactions in tin are very quiet at Paris. French lead, delivered at Paris, is at 55 lvs. per ton; Spanish lead, delivered at Havre, at 54 lvs. per ton; and Belgian and German lead, delivered at Paris, at 54 lvs. per ton. Lead has been in good demand upon the German market, and prices are somewhat higher. Zinc has experienced an advance at Paris. Silesian, delivered at Havre, has realised 25½ lvs. per ton; other good marks, delivered at Havre, 25½. 8s. per ton; at Paris, 25½. 12s. per ton. In Germany all the zinc works are busy; there is a free demand, and prices are well maintained. Intelligence which comes to hand with respect to the Belgian market is generally favourable from a coal trade point of view, displaying an upward tendency. At Liège coal for coking is in great demand; mention is made of a contract for Charleroi Glassworks, for 100,000 tons, at 17. 5s. 8d. per ton; this contract was concluded after the strike. The Sambre has been flooded, and fresh impediments to navigation have arisen in consequence. Perforators on the Rhine and Francois system have had, it appears, some success at present, and in the Cockerell collieries. It is stated that several collieries are disposed to adopt the new system. In the General basin of the Ruhr prices have exhibited considerable fluctuations, and complaints are made of inadequate means of transport. Further the winter advances the more apprehensions of cold, ice, are dissipated, and the more stocks of some descriptions diminish in France. A fall in the price of domestic qualities of iron, indeed, to a larger and larger extent. Industrial coal has, so far, firmly maintained former quotations, and has even exhibited an upward tendency. The French are becoming more and more alive to the importance and desirability of increasing the production of the Pas-de-Calais, if they are ever to relieve themselves of the coal "tribute" which they now pay to their neighbours, Belgium and England.

the price of the refined iron trade is as good as it was last week, in better, as the intelligence which comes to hand is more reassuring. There are no more strikes to be apprehended. Transcave has been resumed rather more actively in the localities in which had slackened with the close of the old year. The orders of export account are becoming more numerous. Pig maintains its price with great firmness, but it is less scarce, as supplies are coming to hand from the recently-lighted blast-furnaces. Remains of the charcoal-made pig is dealt in at 74.4s. per ton, and coke-made at 66.1s. per ton, in the Haute-Marne; in the Ardennes prices are lower; the comparatively stationary at between 54.12s. and 54.16s. per ton, a new casting pig and fine pig are scarcer, and are much more sought after, the foundries are receiving from abroad a fair number of any grade orders for work. In the Comté district fine pig is selling at 84.4s. to 90.12s. per ton, even for rather remote periods of scarcity. The price of iron is maintained without change, but at the same firmness as hitherto. An important order for arms at Etienne has assured work there for some time to come, and is quoted at 144. to 148.4s. per ton. In the Nord, however, as has been some little feebleness; some important transactions concluded in merchants' iron at 124.8s. per ton. A circular by the house of Wendel, all whose works have been annexed to the State, states that having completed the sale of iron at its Lille branch it abandons that place, where it had maintained a depot for a long number of years. In consequence of this decision the property where the dépôt was established is offered to the State. This abandonment by the house of Wendel of the Charleroi market, upon which it had done a considerable amount of business to afford an outlet for some new firm or company in this district. It appears that the exports of rails from France in the first three months of last year amounted to no less than 52,000 tons. Against this we must set rail imports into France in the same period to the extent of 10,000 tons; the imported rails were obtained almost exclusively from Alsace and Lorraine.

GEOLOGICAL MAP OF AUSTRALIA.—A work of considerable importance to the whole of the colonies of Australia has been recently issued by Mr. R. Brough Smyth, secretary to the mining department, and although it will necessarily take some months to bring to conclusion, yet when finished it will be of value not only to the colonies, but to the whole scientific world. This is a geological map of the continent of Australia, and will also include Tasmania. It will, of course, be several districts in the map that will have to be made up for the present, notwithstanding all the care and labour bestowed upon it. The Mining Department has cordially approved of the work, it is intended to be communicated with the Governments of the other colonies, forwarding a draft of the map to the various colonies, with a request that they should be so good as to fill in the blanks from the records of the departments in the colonies. By this means it is anticipated that much useful information will be obtained. In many reports relative to the rock formations of their colonies, the maps compiled from various sources, some of the maps and reports from which have been taken, having been completed as far back as 1834; but to show the accuracy where the geological formation of a district has been compiled from two or more sources, made perhaps at the intervals of many years, and by different individuals, it is anticipated that the map will be the slightest mistake. The geological map of Tasmania has been chiefly taken from the geological maps of the colony, compiled by Mr. T. Gould, the late Government Geologist. The Victoria is merely Mr. R. Brough Smyth's map of this colony reduced to the scale. New South Wales is compiled mainly from the surveys of the Geological Survey, who was for many years Government Geologist in that colony. South Australia is compiled from the surveys of that gentleman and from the maps of Sir Thomas Mitchell, and from the records of the Geological Survey of Australia has been compiled from the surveys of Mr. Ulrich, from maps and reports before Parliament, and from the journals of various explorers. Western

Australia is taken in a recent map compiled by Mr. H. Y. L. Brown. Northern Australia is taken at present as a blank space, with regard to its geological character, but still a good portion of this area has been completely completed from the records of old explorers. It is intended by the compiler that in their first map only the boundaries of the several rock formations will be shown, as there are many large geological problems which have not yet been ascertained, and therefore no attempt will be made to classify such areas until such time as more thorough geological information. As before stated, the map will not be complete at first, but even in its present condition it will be of considerable value, and as the information is added, it will be of increasing value. It will be of great value to the geological students of Australia. The map is of the size of 10 in. by 10 in. and is of the same scale as the geological map of Australia. The map is of the same scale as the geological map of Australia. The map is of the same scale as the geological map of Australia.

FOREIGN MINES.

EMMA (Silver).—Telegram from Salt Lake City, Jan. 27: Raised 200 tons first-class ore last week; 370 tons first-class ore at railway depot; 240 tons first-class raised ore at mine; 220 tons sold here. Mine in good working order. Epizootic stopped; teams hauling.

DE PONDRO. Produce weighed to date (Dec. 28), 4874 lbs.; estimate for month, 6200 oits.—Letter from Mine Captains: The mineral brought out of the mine the past fortnight is of much the same quality as that advised on the 17th, and obtained from the same source.—No. 8 shoot. The southern stopes in this shoot, towards the bottom of the mine, have again yielded some fair quality box work for the wash-house.—The works generally are progressing with usual regularity.—Stopes, Underlie Lode: Only little has been done here, the hands being engaged repairing the 25 cross-cut, and for this reason No. 6 has remained almost under suspension.—No. 8 Shoot: The southern stopes, towards the bottom of the mine, being now in such a state of auriferous quality, that the probability of the obstructing out way is little. Stopping operations are resumed on the northern part of this shoot below Alice's level, where the lode is large, and productive of strake work.—Returns: The working of the No. 8 shoot, below the 25, to increase the returns, has for some time engaged our attention, and after much deliberation we have come to the conclusion that we must, to work at a profit, await the complete drainage of the lodes, as to work in water will not pay cost. We expect to have drain a level in No. 8 lode from the 30 cross-cut, and put up rise, &c, before we can effectually drain the lode. We shall be able to ascertain the real value of the property, as we shall be in a position to work the richest parts of the mine together—Canoe and Nos. 6 and 8 shoots. As far as can be seen, we have no doubt but that we can keep the returns up about 5000 or 6000 oits. of gold a month for some months more; at the same time, no pains will be spared that the drainage may be early effected, and the returns increased; but as to the exact time when this will be accomplished we cannot form a better opinion than that already given, which will make it some seven or eight months from the present time, when we have formed our estimate, and have been on our guard. The 30 Cross-cut. The ground here is so soft that it is unmanageable, it is necessarily very difficult to penetrate to the required size, therefore we are opening a small excavation first, which is progressing very favourably, but as soon as the ground becomes firm the level will be carried to its full size, and the small portion re-opened.—Explorations: Dawson's Mines: No alteration has taken place here since last reported on.—No. 4 Gully, or Open Cutting: On exploring the surface, about 10 fms. west, and below this gully, on the 28th inst., a line of jacinta was met with about 2½ ft. wide, which produces occasional strake work samples, but it is so small, and the ground is so soft, that it is not worth the trouble and expense of being made to develop this as early as possible.

SAN PEDRO.—R. M. Kitto, Dec. 15: The new shaft is sunk about 27 metres below the 135, sinking by eight men, at \$40 per metre, ground still favourable. In the past week we have met with a soft mantle in the shaft, which has impeded the sinking, as we are obliged to secure the same with iron cramps. The tramroad in the 135 south is completed, we are now opening out ground for a winze plot preparatory to sinking a winze in the bottom of this level. The lode, under mantle, here is worth 12 tons of 35 per cent. ore per fm.; the last report gave 10 tons of 30 per cent. ore per fm.; this is on the west part of mantle. The lode on the east of the north part in the 135, south part of mantle, is communicated with the 128; the produce here has considerably fallen off in value, it will now produce 6 tons of 25 per cent. ore per fm. There is a poor piece of ground in this stope, but I think in the back of the 128 there is a fair chance of again meeting with a good lode of ore. This is the point where the former workers found the mantle poor, it was this heaven or warp that deceived them, and we, by changing the mode of working, cut this course of ore in the 135, and have followed it to this point; I think that the same thing will be again met with in the 128. The 128, driving on the north side, for the 135 stope, this stope will produce the same as last reported—10 tons of 20 per cent. ore per fm. The 122, driving on the edge of mantle on the north side, is communicated with the former workings; we have met the big timbers here, the end is continued through the same, and we hope to meet with the same shoot of ore as we had before the communication. The 110 is suspended for the present. The 30, driving on the edge of mantle, will produce 1 ton of 30 per cent. ore per fm. We have completed foundations for engine and boiler houses, the new dressing floors are being carried in. San Felipe, 15 miles from San Pedro, has a mantle of ore, the ore is in large stones of ore, we have had an assay made of the ores that are coming out of the 135, the following is the result:—Gold, 1 oz. 15 dwts.; silver, 51 ozs.; copper, 33 per cent. We have raised in the past month about 3500 qnls. of ore, produced 24 per cent. I calculate that the silver and gold contained in the same will pay the carriage to port. In conclusion, I beg to state that the San Pedro Mine has never looked better in the bottom level, although the stopes have fallen off in value.

ROSSA GRANDE (Gold).—Bahú: Operations in this mine are progressing steadily. The lode in the bottom of sump-shaft is at present 6 ft. 6 in. wide, containing a great quantity of pyrites, and of very fine quality; this, being about 40 fms. deep and 23 fms. below old workings, is, I consider, very encouraging. There is a very important change for the better in the 18 fm. level next, the lode having increased to 50 ft. per fathom. I feel greatly pleased by the fact that our prospects are so cheering. The sinking of the sump-shaft is being forced on as fast as possible, but with the present size lode, which is very hard and wet, great progress cannot be made. The lode in the 28 east has increased in size since my last; it is now 4 ft. wide, of good quality; whilst that in the 28 west is becoming narrower, being now 3 ft. 9 in. wide, of average quality. The lode in the 10 west is at present small, being 1 ft. 6 in. wide, of good quality.—Cachoeira. In Richards's shaft we have put in a second drawing-lift, and the men are at present engaged laying down and repairing incline road; after this is finished to the bottom of shaft sinking will be resumed. The lode in the 20 east is 2 ft. 6 in. wide, of fair quality. Owing to the distance the level is extended from shaft it is necessary to put up a rise to the 10 m. level for ventilation; this was commenced on the 26th inst. The lode in the 10 east is 2 ft. wide, producing good samples of gold.

MALPASO (Gold Washing). Mr. C. R. Clarke, Dec. 18: Since we cleaned up we have only been able to run the machine 16½ days, and, as before, have not been able to do any more. The water is so low that I have to wash in a ditch, which I explained in my last letter, still continues favourable. I have not yet sunk into it, because I want to get further west on it in order to get to the deepest part, so that I may form some idea of its extent. We now have over 100 feet square of it stripped, and in every place it gives a big prospect. I regret very much that I have not sunk higher, but I have not the water, which I should have sent for more pipe, and started lower down at first. There is no change in the gravel ahead of us yet. Since we cleaned up we have put in the ditch, where it washed away 240 ft. of (fine, 3 ft. wide, and 2 ft. deep, besides a great many bits of pole and cement, and so on) to go to the bottom of the gravel, and to the gravel.

RUN (Copper Washing). Mr. C. R. Clarke, Dec. 18: Have not yet been able to

to tell you. The work is progressing satisfactorily, and I am in hopes of having it completed in a short time. The late heavy rains caused some damage on the ditch, but nothing very serious. We are also short one box of rivets, which will give some trouble.

SÃO VICENTE—Dec. 28: The staff at both of these mines has been considerably reduced, and will be further reduced at the end of this month. At Brucutu nothing has been found of any value. At the São Vicente the larger deposit continues to open out strong, and good hopes are entertained of its ultimate success.

TOULIMA—Advices received by the mail of Jan. 29 from the mines

Returns	\$8298	4¾
Cost \$7332 4½; less expended on capital account, \$919 6c...	6413	6½

The manager reports 29 fms. 4 ft. 6 in. of ground expended, of which 18 fms. 3 ft. 10 in. were unproductive; leaving 11 fms. 0 ft. 8 in. productive ground, which is 120% per inch of the whole hole stoped. The total weight of the ore invoiced at this month's produce is 16'96 tons, and the highest value of ore per assay is that shown in a parcel weighing 1 ton 10 lbs., yielding on assay at the rate of 537-385 ozs. to the ton.

The underground agent reports—No. 1 Winze, Spanish Works: The pumping

machinery had to be stopped for several hours to put in the new box, and this delay was sufficient to allow a great deal of water to accumulate at the bottom of this winze.

Now everything is in good time, and working well.

Will be enabled to continue sinking, and open out rich ground for stopes.—Bottom Stope, West and South Drive: The ore at the bottom stope has been taken away as far as the end, and is now allowing the drive to go to more ground to continue stoping the rise, and No. 2 winze, at this point, has a good branch of export ore 6 in. wide.—End on 45 Lode and Stopes: The end is poor, but is opening rich ground for bottom stopes. The back stopes at this level are yielding rich ore, and continue good; the branch of solid ore is 3 in. wide.—No. 2 Winze: The mineral has improved, and this station has opened good ground for stopes; about 10 ft. more will hole through into the bottom level.—Powder-house: The lode has increased in size and looks promising.—Surface Extraction Level: We have been securing the old workings, and have commenced driving in mineral ground. We expect a rapid improvement. The manager also reports the outcrop of a new lode on the road near his house, and he gives on the same the following assay:—

Gossan	Ores.	7	3	17
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Second sample of above..... 19 15 11

UNITED MEXICAN.—Extract of a despatch from Mr. Edward Hay

dated Guanaxuata, Dec. 23.—Mine of Jesus María y Jose. The number of buscones having increased, it is hoped that a more plentiful supply of ore will be obtained for the reduction works. The careful picking of the ore by the buscones has brought up the ley considerably. The outlay being notably reduced I expect the result for the quarter will be a favourable one.—Mine of Remedios: The pickers still above 200 carags of ore for the haciendas, and the buscones work in the mine and sort on an average 20 carags of good ore per week. Concern: Adit of San Cayetano (see R. of R. of A. of O. Dec. 20, in the cross-cut of La Verdada to the south, a new relic (wall of the lode) having been traversed, water came from it, and on the 21st, another wall having been holed with the same result, the water is now oozing out from two places in that end. The northerly direction given to the end of the adit west is continued, and on Dec. 21 we were a little more than 1 vara inside the upper wall of the lode. The water has augmented in proportion to the breadth of the vein that is discovered, and it runs out pretty freely now. The veinstuff improves in appearance, though no silver has as yet been found.—

Mine of San Antonio de la Ovejera: In the cross-cut of San Fernando a small relic has been discovered, but as it has not yet been traversed, nothing more can be said about it by this mail.

COLORADO TERRIBLE.—The 23d and 24th shipment of ore have been disposed of at prices varying from \$15, 17s, 2d. to 112s. 1s. 4d. per ton. The ore raised during November (5 tons second class, and 15 tons third class) was worth \$900; the expenses were \$318s. 5p. The small quantity is due to alteration of drawing-gear from hand to steam-power. The December and subsequent expenses will not exceed \$2000 to \$2200. The work now doing is all dead work, and the monthly yield of ore during the winter is not expected to exceed in value monthly charges.

ORGANOS. The local manager at this mine, in a report addressed to the general manager at Frias, states that more attention has been paid to open work this month, making up for the delay, and, as the stamps will be full for some time longer I shall be able to continue the good work. **Open Cut.** Cross-Cut: Total length, 9 fms. 3 ft.; driven during the month, 5 fms. 3 ft. By measurement we should cut the old winze or the lode in 3 fms. 3 ft. more, but the lode dips towards us we may do so in less. Ground very soft. Esperanza: Total length 28 fms. 6 in. about 10 ft. wide, but very much broken up, though nearly the whole of it is good for stamping. **Open Cut.** Cross-Cut: Total length 28 fms. 5 ft. driven during the month. Little work has been done here, as you will notice, and the lode remains the same as last month; about 18 in. solid quartz of fair quality.—**Welton's Open Cut:** I have only just commenced this work, about 1 fathom of ground only having been worked, but I shall be able to give you a more detailed report in a few days. **Open Cut.** Cross-Cut: Total length 28 fms. 5 ft. driven during the month. **Open Cut.** Cross-Cut: Total length, but found nothing in the end, though outside there is a very promising looking lode, about 6 in. wide, good quartz, and carrying much galena and pyrites. **New Lode, West West:** To reach the lower part of the lode a cross-cut was commenced, and the stamps were set to work on it, and as the work was not so well known as it seems partly full of attle to unwater and clean this we have commenced another cross cut lower down (5 fms.), which has now gone in 7 fathoms and should cut the winze in 6 fathoms more. "It seems to me," adds the local manager, "encouraging to find extensive workings here, as from what we have seen of the pansies mode of working this winze they must have had something good in it, but I can't trouble you with more details at present."

LANEOSTA.—Jan. 17; **Esperanza:** The tributers here finding the work did not pay them, have given it up.—**Santa Lucia:** In driving level at incline, the dolomite bed was cut through at bottom of incline, showing 10 ft. thick, but having no trace of ore the men have been placed to drive east and west at point where ore was last seen; a little calamine now shows in the west end.—**Assinicion:** In exploring through ancient works we have reached firm ground, and find a branch of lead 3 in. wide, yielding $\frac{1}{2}$ ton of ore per fm.—**Glaunafro:** In sinking San de Uso shaft the lode is 3 feet wide, consisting of calcareous spar, with druse veins, combined with a hard siliceous rock, difficult to sink, yielding occasional small pieces of lead. The lode is 100 ft. long, and is the richest in the district and progress is slow.—**Aurora:** In driving through lode at Pardo's shaft, 10 ft. has been cut through 6 feet wide, chiefly calcareous spar, with earthy matter spotted with lead, but generally poor and unpromising. The driving is continued to see if more lode stands east.—**La Flora:** In driving deep adit the lode at this place remains very large and poor, having a thin vein of lead only, of little value. In sinking winze from ditto the winze is still going through unsettled ground around vugh lode in bottom, small and poor; lead gone through proves to be poor, partly only the vugh.—**La Luisa:** The sinking winze from venture adit continues through lower earthy rock, with now and then a good stone of lead contained in it.

LINARES.—**Fojo Ancho, Jan. 15:** The lode in the 85, driving west of Crosby's shaft, contains a little ore, but not enough to value. In the 75, west of Crosby's shaft, the ground is hard for driving, and the lode small and poor. The 75, west of San Francisco shaft, is opening up a good length of valuable ground yielding 2 tons of ore per fathom. The lode in the 75, driving east of San Francisco shaft, is diminishing in size and value. The lode in the 65, west of San Francisco shaft, is small and poor. The lode in the 55, west of San Francisco shaft, of a promising appearance, consisting of carbonate of lime and lead ore, yielding $\frac{1}{2}$ ton per fathom of the latter. The lode in the 55, east of San Francisco shaft, is improving, and yielding good stones of ore, worth $\frac{1}{2}$ ton per fathom. In the 45, east of San Francisco shaft, the lode is small and unproductive.—**Winzes:** The lode is improving in No. 181 winze, sinking below the 35, yielding 1 ton of ore per fathom. No. 182, sinking below the 35, is going to be a productive winze, worth 1 ton of ore per fathom. The lode in No. 183 winze, below the 35, is large and strong, and yielding fine lumps of ore, worth 1 ton per fathom. The lode in No. 184 winze below the 75, is small, consisting of quartz and lead ore, yielding of the latter 1 ton per fathom.—**Los Quinientos Mine:** The lode in the 45, west of Taylor's engine-shaft, has become more open, and is letting out water more freely. There is a good stone of lead in the upper part of the 55, west of Taylor's engine-shaft, yielding $\frac{1}{2}$ ton of ore per fathom. In the 65, driving east of Taylor's engine-shaft, the ground is hard, and the lode small and poor. The lode in the 55, east of Taylor's engine-shaft, is small, yielding a little ore, but not enough to value. In the 45, east of Addis's shaft, there is a strong open lode, showing indications of improvement, yielding $\frac{1}{2}$ ton of ore per fathom. The lode in the 45, driving east of San Carlos shaft, is small and poor. The lode in the 55, east of San Carlos shaft, is large and strong, composed of quartz and lead ore, yielding $\frac{1}{2}$ ton of the latter per fathom. The lode in the 55, east of San Carlos shaft, is regular and well defined, yielding lead, but not enough to value. The 45, east of San Carlos shaft, is very hard and poor. The lode in the 32, east of Judd's shaft, has fallen off a little in value, now yielding 2 tons of ore per fathom. The 45 cross cut, south of Henty's shaft, is being pushed on as fast as possible.—**Shafts and Winzes:** The shaftmen in Taylor's engine-shaft, sinking below the 65, are engaged in erecting a plunger lift. Good progress is being made in San Carlos shaft, sinking below the 55 ft level. Cox's shaft, below the 45, is being pushed on with all possible speed. In the 45, below the 45, the men are fixing a penthouse and tackle. The lode in the Luca's winze, below the 35, continues large and productive, yielding 3 tons of ore in a fathom.

ALAMULLOS.—Jan. 15: The lode in the 60, driving west of San Rafael shaft, has decreased in size, and is quite valueless. In the 50, west of San Francisco shaft, the lode is well defined, and of a very promising character, yielding $\frac{3}{4}$ ton of ore per fathom. The granite is very hard for driving throughout in the 50, east of La Magdalena shaft. The lode in the 75, east of La Magdalena shaft, has been very rich for some time past, but has failed considerably within the past few days, yielding 1 ton of ore per fathom. The lode in the 85, east of Taylor's engine-shaft, is composed of calcareous spar, spotted with lead. The lode in the 85, west of Taylor's engine-shaft, has become very loose and ugly, yielding only 1 ton of ore per fathom. The lode in the 90, east of Taylor's engine-shaft, is very rich in the back, yielding 1 ton of ore per fathom. There is no improvement to report in the 50, east of San Victor's shaft. The lode in the 40, west of San Victor's cross-cut has a very kindly appearance, and is letting out water freely, yielding $\frac{1}{2}$ ton of ore per fathom. In the 40, west of San Victor's cross-cut (middle lode), the lode is very much disarranged. The lode in the 50, west of San Victor's cross-cut, is large, but very hard for driving through. In the 20, east of Addis's shaft, the lode has very much improved within the past few days, now producing 2 tons of ore per fathom. The lode in the 20, west of Addis's shaft, yields 3 cones of lead worth 1 ton per fathom. The lode in the 20, east of the shaft, is good. The lode in the 40, east of Crosby's shaft, the lode is composed of decomposed granite, and is tolerably easy for driving. The 50, east of Crosby's shaft, continues poor. The lode in the 50, east of Crosby's cross-cut, is very open, and letting out a great deal of water. The lode in the 50, west of Crosby's cross-cut, is small, and quite unproductive. In the 40, west of Morris's shaft, the lode is spotted with lead. The lode is disarranged in the 50, east of Judd's engine-shaft. In the 50, south of Judd's engine-shaft, the granite is very hard for driving through.—Shafts and Winzes At Alamullos, Jan. 15: The 20, having completed the 200 fathoms, the 200 fathom shaft and ci-stern-pit, sinking has been resumed. There is no good lode at Swadfield's shaft, below the 20, a week ago, yielding $\frac{1}{2}$ ton of ore per fathom, but it has since failed. The lode at Air's shaft, below the 50, is not nearly so good as it has been, yielding $\frac{1}{2}$ ton of ore per fathom. The lode in Romero's winze, below the 50, is of no value. Granero's winze, below the 75, is being put down speedily in an open lode. The lode in Aro's winze, below the 30, has improved within the past few days, yielding $\frac{1}{4}$ ton of ore per fathom. The lode in Gea's winze, below the 40, continues very regular, yielding 1 ton of ore per fathom. Diego's winze, below the 50, is in a good position, and has commenced in a good position, yielding 1 ton of ore per fathom, worth $\frac{1}{2}$ ton of ore per fathom, which has since failed. Lucio's winze, below the 20, has struck into a small branch of lead.

FORTUNA.—Jan. 15: Canada Inco: The lode in the 110, driving west of Henry's shaft, continues small, and the granite is very hard for driving. The lode in the 100, west of Judd's shaft, has diminished both in size and value now yielding $\frac{1}{4}$ ton of ore per fathom. The lode in the 80, east of Henry's cross cut, contains spots of ore. There is a small branch of ore in the lode in the 60, east of San Pedro's shaft. The lode in the 60, west of San Pedro's shaft, is again improving, and has a promising appearance, yielding $\frac{1}{4}$ ton of ore in a fathom. There is a small improvement in the 80, west of Judd's shaft, yielding $\frac{1}{4}$ ton of ore per fathom. The lode in the 80, east of Judd's shaft, is large, with spots of ore, but does not contain enough ore to value. The lode in the 80, west of Lowndes' shaft, is strong, regular, and contains stones of ore. In the 90, west of Lowndes' shaft, the lode produces good stones of ore, but scarcely sufficient to value. The lode in the 90, east of Lowndes' shaft, is of an open and promising appearance, yielding $\frac{1}{2}$ ton of ore per fathom. In the 80, east of Carro's shaft, the lode is smaller, and less productive than it was a few days since, yielding 1 ton of ore per fathom.—St. John's Mines: In Kennedy shaft, since the 10th, the men are working at a slow, moderate rate well. Frederick shaft, below the 40, is off the lode, and in hard granite. The lode is small and poor in Jorge's winze, below the 50. The lode has failed in Puente's winze, below the 100.—Los Salidos Mine: The 110, driving west of Buenos Amigos shaft, has fallen off in value in the past few days, yielding 2 tons of ore per fathom. The ground is hard for driving, and the lode very small in the 100, west of San Carlos shaft. The 90, west of San Carlos shaft, continues unproductive. The lode in the 110, east of Morris's engine shaft, is promising, more settled, and better defined than it was, yielding 1 ton of ore per fathom. The 100, west of Morris's shaft, is yielding 1 ton of ore per fathom. The 100, west of Pablo's shaft, has been disarranged for some days past, but we expect it will again improve shortly, yielding 2 tons of ore in a fathom. In the 90, east of Miguel's shaft, the lode continues very small. The ventilation being imperfect, the driving in the 25, west of Palgrave's shaft, is suspended while we put a shaft through from surface: the lode is worth 1 ton in a fathom. In the 35, west of Palgrave's shaft, the lode is much improved, yielding 4 tons of ore per fathom. In the 35, east of Palgrave's shaft, not having increased either in size or breadth, the lode is yielding 1 ton of ore per fathom. The men are making satisfactory progress in Morris's engine-shaft below the 110. In Palgrave's engine-shaft, below the 35, the lode has a promising appearance, and is compact and regular, yielding 1 ton of ore per fathom. Mariano's winze, below the 100, is going down in a compact and regular lode, yielding 2 tons of ore in a fathom. The 100, west of Mariano's shaft, is going down in a compact and regular lode, yielding 2 tons of ore per fathom. The lode in Julian's winze, below the 100, is going down in a splendid shoot of ore, yielding 4 tons per fathom. A very good rate of raisings was kept up during the past month, and the stops are yielding very well at present. The ordinary surface operations are going on very regularly, and the machinery in both mines is in good working order. We estimate the raisings for January at 350 tons.

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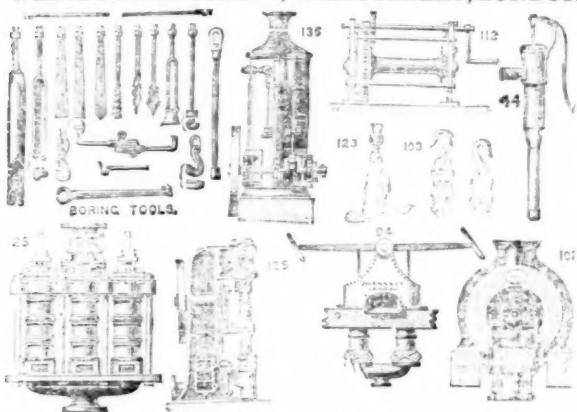
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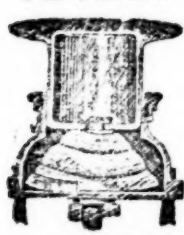
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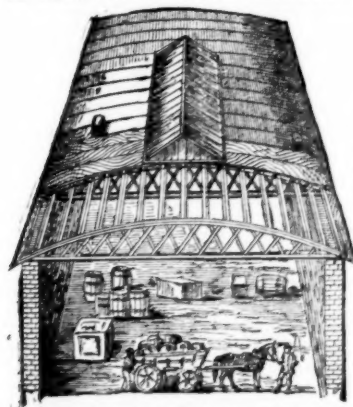


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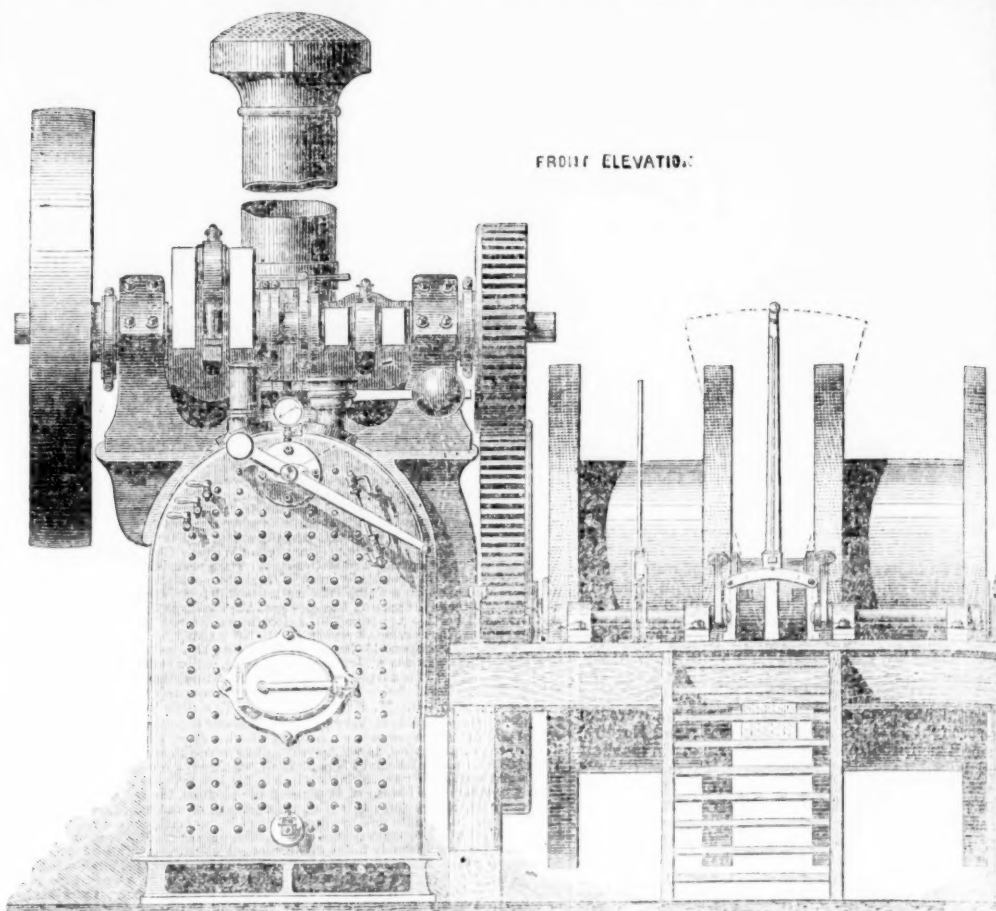
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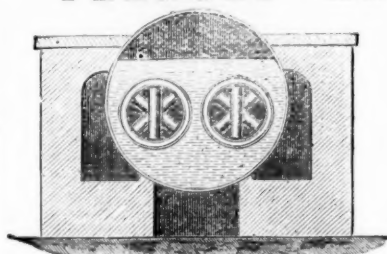
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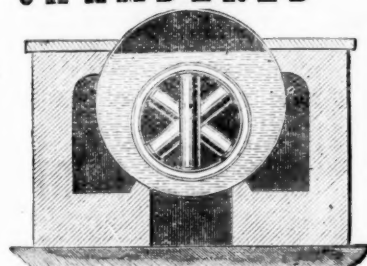
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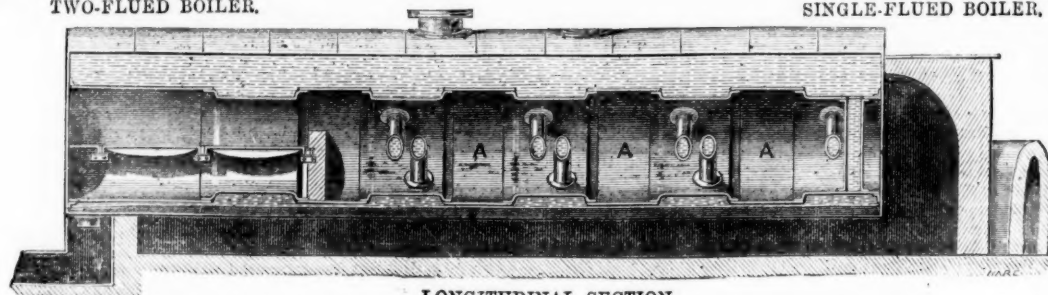
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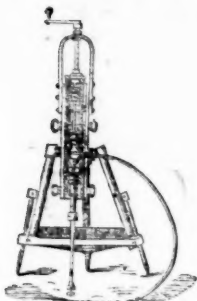
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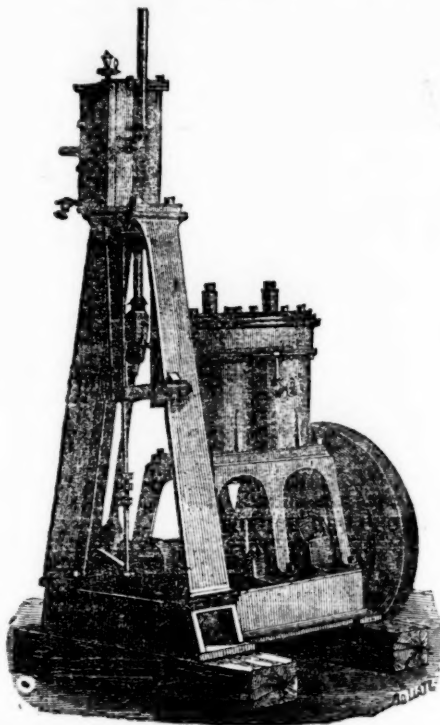
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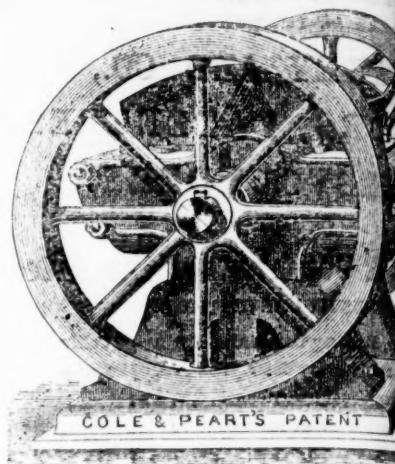
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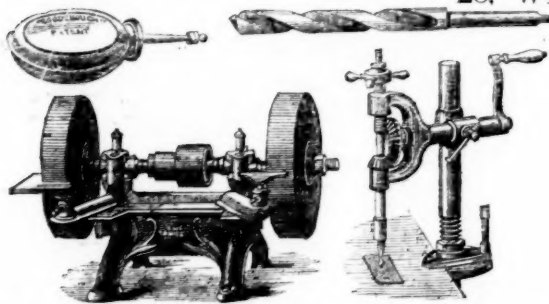
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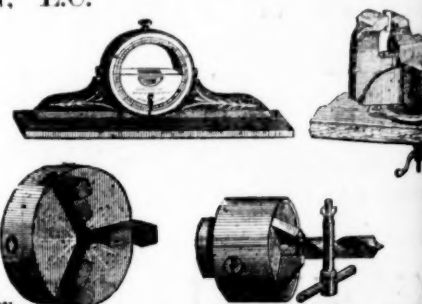


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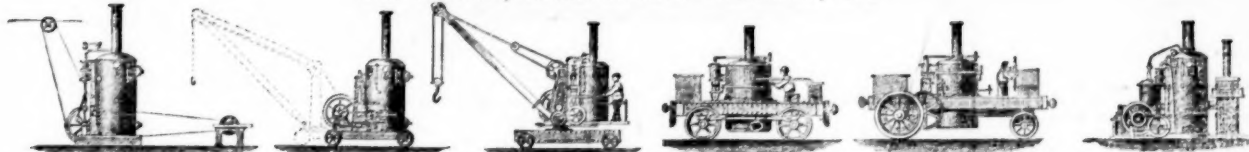
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